The Well spring of Sciences.

Which teacheth the perfecte worke and practise of Arithmeticke, both in whole Numbers and Fractions: set forthe by

HUMFREY BAKER Londoner, 1562.

And nowe once agayne perused augmented and amended in all the three partes, by the sayde Authour: whereunto he hath also added certain tables of the agreement of measures and waightes of diuers places in Europe, the one with the other as by the table following it may appeare.

1583.

To the right vvorshipful THE GOVERNOVR ASSISstantes, and the rest of the Company of *Marchaunts aduenturers* : Humfrey Baker : *Londoner wisheth health with continual increase of cōmoditie by their worthie trauaile.*

(·.·)

IF the knowledge of arithmetick (right worshipful, were of so smal profite in the life of mā or so little vsed in our worldly affaires, that it might be well lefte, or but sieldome frequented, it were well done by the professors therof, to penne very long & eloquent Orations, in setting forth the commendation of the same. But since experiēce hath taught to be true the old prouerbe : That where good wine is to sell, there neede no garlād be hāged out, me thinketh they doe great iniurye vnto Arithmetike, that seeke to heare the com-

modities thereof sette foorth in a shorte Epistle, and surelye they ouercharge me in laying such a burthen on my backe as were too importable for the greatest Oratoure. For the skill hereof is well knowne, immediatelye to haue flowed from the wisedome of GOD, into the heart of man, whome he hath created the cheefe image, and instrument of his prayse and glorye, reuealing himselfe vnto him so farre as he judged conuenient: whome notwithstanding he could not conceaue to remayne in the moste secrete mysterie of Trinitye in Vnitie, were it not by the benefite of moste diuine skill in numbers, whiche skill as also the moste full and effectuall knowledge of all other thinges vnspeakeable, GOD vsed in his wonderfull creation of all the worlde oute of nothing, which hee accomplished within the compasse of certaine number of dayes expressing moreouer what hee made in euery daye, and of certaine his creatures how many he made as appeareth

reth in the booke of Genesis, written by special reuelatiō of the holy ghost, wherin the diuine maiestie of God could not be knowne vnto vs, without the knowledge of numbers: nor Moyses haue vnderstoode what himselfe had written. And Salomon the wisest man that euer was, considering the verye depth of all thinges within his minde, to whome God had giuen a greater gifte of wisedome, then to any man eyther before or since ? doubted not to breake foorth in these wordes, saying ? Thou O Lorde haste disposed all thinges in measure, number and waighte, for thus it pleased him to iudge, who in another place testifieth, howe that hee hath searched deeper into the causes and knowledge of all thinges then any other man in the world.

These testimonies (right Worshipful) doe manifestelye teache vs what wee ought to thinke of the cause, and originall of Arithmeticke, & partly also how necessarie it is in the life of man, that

vnlesse by nature, Wee haue some feelinge and vnderstanding therein, wee are no better than beastes, and in this respecte worse, for that wee retayne not that whereunto wee are as speciallye borne, as naturallye they doe, some to running, some to smelling some to hearing, some to flying, and some to swimming. Take awaye Arithmeticke, wherein differeth the Sheapehearde from the sheepe, or the Horsekeeper from the Asse? Surely but only in shape and figure, whiche as the learned affirme, is a very slender cause of difference. Wherefore not without iuste cause haue the auncient Fathers, and Philosophers singulerlye extolled the knowledge of Arithmeticke, dilligentelye trayning vppe theire youthe therein, as in a science moste necessary of it selfe, considering the deepe deuices, the profounde practiles, and cunning conclusions therein conteyned: and also that it is the keye and entrance into all other artes and lear-

ning:

ning : as well approued the noble Philoſopher *Pithagoras* who cauſed this inſcription to bee written (vppon his ſchoole doore where hee taught Philoſophie) in great letters, *Nemo Arithmetica ignarus hic ingradiatur*: Let none enter heere, that is ignorante in Arithmeticke: whiche ſaying, as it is proper and peculier vnto all ſortes of men in the beginning and entrance into all Liberall knoweledge and faculties to be enſued and embraced, ſo ſurelie aboue all other, it is (nexte after the woorde of GOD) moſt fitte and neceſſarie that it ſhoulde bee written vppon youre Schoole doores (righte worſhipfull) whoſe trade and trauaile is employed in the noble trafficque of Merchandiſe wherein yee haue neede of continuall recourſe vnto this excellent arte. The dayly exerciſe whereof hath ſo ſharpened youre iudgementes, and ripened youre vnderſtandinges, that moſte of you are become ſinguler therein, both to

deale that way your ſelues, and to iudge of other mens doinges. And heerein I am ſure you are good witneſſes with mee howe fooliſhe and vaine is theire opinion whiche beſide your moſte commendable affaires, ſuppoſe and affirme that Arithmeticke is of ſmall vſe vnto anye other men, ſeeing that the Lawes of ſundrye Realmes well inſtituted and guyded haue deſeruedly accompted for fooles, and vnfit members, (to rule or deale in a common wealth,) all ſuche as wanted the ſkill of naturall Arithmeticke, depriued them bothe of Landes and liuing, whiche as it tendeth vnto no ſmall praiſe and credite of Arithmeticke, ſo I am conſtrained for breuitie ſake, in fewe wordes to ouerpaſſe both that and others whiche mighte bee ſayde in commendation thereof. Shortly: admoniſhing your worſhippes, that wheras in times paſte as is well knowne, I had trauailed in a booke in Engliſhe of that facultie,
dedicated

dedicated vnto you: being nowe enforced to runne ouer the same, bothe amending and augmenting it with sundrye Additions: I am so bolde againe to attempte youre worshippes with the acceptation thereof, hoping that as in fore time yee haue taken it suche as it was, ye will now also daigne to receaue it. beeing in better case (I hope) then euer it was a token of my good will, howe bee it a simple thinge, wherein you maye weighe the harte and not the gift, proceeding from suche a Fountaine, that if better skill and knoweledge had beene matched to my good meaning, it shoulde haue beene doone otherwise, to the better contentation of your worthinesse. And therefore in the meane season vntill it please GOD to furnishe mee in suche sorte, I rest in daylye prayer vnto him, to mainetaine your fellowship in happie estate and to blesse your purposes with luckye successe, to guide your voyages with

wished

wished encreaſe, & to ſeaſon your doe-
inges with all kynde of Vertue,
and to preſerue your liues
with deſired health
to his will and
pleaſure.

At London the
2 day of September. 1580.

The

The Prologue to the gentle Reader.

HAuing ſometime nowe twelue yeres ſithence (gentle Reader) publiſhed in print one Engliſhe booke of Arithmetick, conteining, as I *ſuppoſe, ſundrie neceſſarie & profitable documentes for ſuch as are willing to attayne any knowledge therein. I haue bene often ſince that time, and of very late alſo, requeſted by ſundrie of my friendes to peruſe the ſame worke, & as I ſhould nowe iudge it expedient, to adde ſomething more thereunto, and to amplifie the ſame. Which earneſt and friendlye ſute of theirs, for certaine iuſt cauſes ſeeming needefull vnto mee, ſurely I could in no wiſe denie. For vvhen I perceiued the importunitie of certayne ſtraungers not borne within this lande, at this preſent and of late dayes, ſo farre proceeding, that they aduaunced and extolled themſelues in open talke and writinges, that they had attained ſuch knowledge and perfection in Arithmetike, as no engliſh man the like: Truly me thought that the ſame report not only tended to the diſpraiſe*

dispraise our Countreymen in general. But touched especially some others & me, that had trauailed and written publikely in the same facultie. For vnto this same effecte they haue of late painted the corners and postes in euery place within this Citie with their peeuish billes, making promise and bearing men in hande that they coulde teache the summe of that Science in breefe Methode and compendious rules, such as before their arriuall hath not bene taughte within this Realme. Whose sayings to bee false, and writings vntrue, If I were thereto required by men of authoritie I am well able to proue, and that more is, (bee it spoken without enuie, or thirst of praise) euen within this same booke, if it maye please thee to make triall are general preceptes, & rules to bee founde, such, as they can bring forth neither briefer nor better. But this is no rare thing, since in other matters of greater importance, their attemptes are too too perrillous, and their deedes outragious, wel diseruing restraint and banishment, against one of whome, verelye not of mine owne accorde, but constrainedly, I haue bene enforced to sharpen my pen, for that

be as I here say, continueth in dispraise of our nation, saying that we are vnskilfull in those rules that he teacheth, & himself excellēt in the knowledg of arithmetick: wher in, if true trial might be indifferent iudge, I doubt not but he woulde be founde to haue least skil of a great many. Of whome perhaps if I should write vpon report of others, I could say somwhat more, which woulde (if it were true, and he knowne) redounde vnto his vtter discredite, whiche for this cause, I omit to doe, least the crime of arrogancie might be thought to rest within me, which I obiect against him. Howbeit, thus much I dare affirme, that there are diuers in this honourable Citie, who although they aduaunce and extoll not themselues (so malapertly) as these sort of men are accustomed to doe in all that they professe, yet doe farre surpasse them, as wel in the knowledge of nūbers, as in al other kind of learning & skilfulnes. Another cause also there is of this present edition, as it seemeth to me very iust & necessary. For when a certain wel willer of mine purposing to employ som time in bettering his knowledge in Arithmetike,

through

through the reading of this present booke, did certifie me that he in perusing the same had espied so manye errours committed in the printing, that he coulde gather no truth thereby. I was not a little mooued thereat, since that by the disordring thereof, neyther the worke retayned his true meaning, neyther could the learner attaine his desired knowledge: and surely no maruaile, for as I am credibly informed, since it passed out of my handes, it hath bene often times printed without the viewe of a skilfull corrector, vnto the great discredite of the authour. These and suche like considerations, vrging me forwarde, and not forgetting the fruite, louing Reader, that may growe vnto thee hereby: I haue taken in hande both to amend and augment the same, seasoning (as it were afreshe) all three partes of the worke, with diuers questions and examples, very necessarie and profitable: hauing also for thy commodity, added vnto the end of this booke diuerse and sundrie tables of the agreement of measures and waights of sundrye places reduced to an equalitie the one to the other. Vnto thee therefore my request

quest is thankefully to accept the same, and in good part, wishing well to him that trauaileth for thy benefite, not disdaining it in respect of grossenesse of the stile, or rudenesse of vtteraunce, since that this Science requireth not eloquence of writing, but plaineneße of teaching, and truth in working of diuers conclusions by numbers onely, desyring thee, if thou be willing to profite heereby, fyrst friendlie to amende the faultes that haue escaped in the printing of the same, and then to begin at the entrance of the booke, and so orderly proceeding forwarde vnto the ende, not turning vnto the middest or last part thereof, vntil thou perceauest well that which wente before: and so doing thou shalt not onelie attaine to the perfite knowledge of the whole effect, but be able also by thine one labour and industrie to vnderstand all other bokes of arithmetike what soeuer: and thus I bid thee farwell hartilye.

Here followeth the table of all that is contained in this booke.

The seond part of this booke treateth of *fractions or broken numbers*

a. The

The third parte of this Booke treateth *of all maner of necessarie questions, which are vsed in the trade of Merchandise.*

FINIS.

The Diffinition of Number.

NVMBER IS AS much to say as a multitude composed of many vnities, as two is composed of two vnities, three is composed of three vnities, foure of foure vnities, fiue of fiue vnities, ten of ten, fourteene of fourteene, fifteene of fifteene, twentie of twentie vnities, &c.

And therefore an vnity is no number, but the beginning and originall of number, as if you doo multiply or diuide a vnity by it selfe, it is resolued into it selfe without any increase. But it is in number otherwise, for there can be no number, how great soeuer it be, but that it may contynually be encreased by adding euermore one vnitie vnto the same.

owne value ten times: as 70 is se-
uen times ten: that is to say, seuentie.
80 is 8 times 10, y^t is to say, eightye.
In the thirde place euery figure beto-
keneth his own value a hundred tymes,
as 700, in that place betokeneth a hun-
dreth times 7, that is to say, seuen hun-
dreth. In the fourth place euerye figure
betokeneth his owne value a thousand
times: as 7000, is seuen thousande, and
8000, is eyght thousand. These foure
first places must bee had perfectly in
minde, yea and that by hart as they say,
for by the knowledge of them you may
expresse all kind of numbers, how great
soeuer they be.

In the fifte place, euery figure be-
tokeneth his owne value ten thousand
times: as 70000, is ten times seuen
thousand, that is to say seuentie thou-
sande. In the sixt place euery figure
standeth for his owne value, a hun-
dreth M. tymes. As 700000, is seuen
hundreth thousande. The seuenth
place, M. M. times, or a million: as
7000000, is seuen M. M. or seuen

millions, and the eight place ten M. M times, or ten millions: so that euery place, toward ỹ left hand, exceedeth the former ten times. But nowe for the easie reading, and readie expressing orderlye of any summe proposed, you shall practise in thes maner following, and for example, I propone this number 765431658, in the which are ix. places. In the first place is 8, and betokeneth but eyght, that is to say, once his owne value, in the second place is 5, and betokeneth ten times fiue, that is 50: in the third place is 6, and betokeneth an hundred times sixe, that is vi. hundred. In the fourth place is 2, and that is two thousand, and 3 in the fift place, is ten thousand times 3 that is xxx M. So 4, in the sixt place is C, thousande times 4, that is 4 hundred M. Then 5, in the seuenth place is a M, M times 5: that is fiue M M, or rather fiue millions: and 6 in the eyght place, is sixe times ten millions, that is lx. millions, and laste of all vii in the ix. place is vii. C, millions,

ons. Now followeth the practise, First put a prick ouer the figure, and so ouer the seuenth, and likewise ouer the tenth. And also ouer the 13, 16, or 19, if you haue so many, and so stil leauing two figures betweene euerye two prickes, and these roomes from one pricke to an other, are called Ternaries, then you must pronounce euerye three figures from one prick to an other, as though they were written alone from the rest. And at the end of their value, adde so many times a thousand, as your number hath pricks: (that is to say, if there be but 1 prick, it is but 1 M: if 2 pricks one M, M, or else a million, if 3 pricks, one M, M, M, or a M milions. And so consequently of all other figures following.) Then come likewise to ẏ next iii. figures, and sounde them as if they were apart from the rest, and ad to their value so manye times thousandes, as there are prickes betweene them and the firste place of your whole number. And so doe by the nexte three figures

following,

following, and all the rest likewise as in example 4 5 1 2 3 4 6 7 8 5 6 7. The first pricke ouer 8, in the fourth place which is the place of a M. the seconde pricke is ouer 4, in the seuenth place, which is the place of a M, M, or one Million, the thirde pricke is ouer the tenth place, which is the place of a M, M, M, or of a M Millions as in the former Example. Then for the expressing of this number by the value of euery figure, according to the place wherein they stand, you shall first beginne at the last pricke ouer 1, and take it and the other two figures 5, and 4, which are behinde the saide 1, towarde your lefte hande: and value them alone, and they are foure C li, M. M, M, or else CCCC li, M millions, Then take the other three figures from 1 to the next pricke towarde your right hande, and value them as if they were apart from the other, and they are 234 which doe signifie CCxxxiiii millions, or 234 M M. Then come to

3. kinds of number.

Digit. Article.

Mixt or compound

the third pricke ouer 8, and take the other two figures behinde it, and recken them likewise as if they were alone, and they are sixe Clxxviii M. And last of all come to the other three figures which remaine, that is 567: and they are fiue Clxvii. Thus the whole sum of these figures, is four Cli. M, two Cxxxiiii, millions, sixe Clxxviii M. fiue Clvii, as before.

3. kinds of number.

Note also that whole number is diuided into three kinds, that is to say, diget number, article number, and mixte or compound number. The diget number, is all maner of numbers vnder ten, whiche are these nine figures, 1, 2, 3, 4, 5, 6, 7, 8, 9. of the which I haue spokē before. The Article number is any kinde which hath in ẏ first place a Cipher, as this 0. & they may euer be diuided iust by 10, without any remaine, as these 10, 20, 30, 40, 50, 100, and all other such licke. The mixt or compounde number conteineth diuers and many artcles, or at the least one article, and a diget, as,

Diget.

Article.

Mixt and compound.

11, 12, 16, 22, 38, 108, 1007, and so foorthe. And as any article number may bee made a compounde, by puteing thereto a diget, euen so likewise euery compound. number, may be made an Article number by adding thereunto an o.

And

¶ And heere followeth a briefe rehersall of the order and Denominatours of the places. And this shall be sufficient for Numeration.

The order of the places.		*The denominatours of the places.*
First place.	5	Unities.
Second place.	4	Tenthes.
Third place.	3	Hundreds.
Fourth.	8	Thousands.
Fyfth.	1	X. thousands.
Sixte.	0	C. of thousands.
Seuenth.	1	Millions.
Eyght.	2	X. of millions.
Ninth.	3	C. of millions.
Tenth.	4	M. of millions.

Addition in whole number.
Chap. 2.

ADdition is as much as to bring togither two summes or more into one as if there were due to any man 223 li by some one body: & 334 li, by another, and 431, by another: and you woulde know how many poundes is due to the same man in all, these three summes shall you set downe orderly the one under the other, writing the greatest summe highest, and the nexte to the greatest under it, and the leaste summe under the last, in suche sorte that the first figure of the one summe towarde your right hande, be directly under the first figure of the other, and the seconde under the seconde, and so foorth in order. When you haue thus done, drawe under them, a straight lyne, and then will they stand thus.

431
334
223

Nowe beginne alwayes at the first places towarde your righte hande

hand and put together the three firste fygures of the first places of these three summes, and looke what commeth of them, & write that vnder them beneath the lyne, as in saying 3, 4, and 1, being putte togeather doe make 8: write 8, vnder 3, as here you see.

4	3	1
3	3	4
2	2	3
		8

Then go to the second places of fygures, and doe lykewise: as in saying 2, 3, and 3, make 8, write 8 vnder 2, as here you see.

4	3	1
3	3	4
2	2	3
	8	8

And doe likewise with the fygures that bee in the thirde place, in saying, 2, 3, and 4, are 9, put nine vnder them, and so will youre whole summe appeare thus whereby you maye perceiue that those three summes being added together doe make 988 pounde, and this is the arte of addition, according to his simplicitie, when the summe of any place doth not exceede a diget number. But in case the summe of any one place cannot bee

4	3	1
3	3	4
2	2	3
9	8	8

expressed

expresses by one figure, but by two, you shall put the firste of those figures vnder the line, and keepe the other in your minde for to adde it vnto the firste figure of the next place, and if the same next place cannot be aualued but by 2 figures, you must in like maner put the first of those figures vnder the line, and reserue the seconde for the other place next after, & thus must you do from one place to another vntill you haue come to the last place, where if it happen you doe finde that the summe be of two fygures, you must set them both downe because it is in the end of that work, as in this example.

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 734682456
 459837345
  13467891
   4672123
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1203754815
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Where the first figures are 3, 1, 5, 6, which added together maketh 15, &

for that, that 15, is of two figures, I doe put the first figure 5, vnder the line, and keepe the second figure (which is 1) in my minde, the whiche I must adde with the next figures of the secōd place, that is to say, with 2, 9, 4, and 5, the which together make 21. I write 1 vnder the line, for the second figure of that addition, that is to say after 5: and I keepe 2 to be added to the third place the which with the other figures, 1, 8, 3, and 4, do make 18, therefore I put 8 next after 1 in the third place vnder the line, and keepe 1 to bee added vnto the fygures of the fourth place, whiche is with 2, 7, 2, 2, the which with the 1 that I keepe, do make 14: I set down 4, for the fourth fygure (vnder the lyne) that is to say, behind 8: and I keepe 1, to be added vnto the figures of the fift place, the which is 7, 6, 3, and 8, with the 1, that I keepe, maketh 25: I put 5 in the fift place, vnder the lyne next after 4: and I kepe 2 in mind to be added with the fygures of the sixt place, that is

 with

with 6,4,9 and 6, and that 2, whiche I keepe, maketh 27: I write downe 7 vnder the line in the sixt place, and I keepe 2 whiche I adde with the figures in the seuenth place, and they make 13: I put downe 3 vnder the line in the seuenth place, and adde 1 vnto the figures in the eyght place, and they are 10: I doe put 0 vnder the line in the eyght place, and then I adde 1 vnto the ninth place, that is to saye, with 4 and 7, and they make 12: the which 12 I write at length vnder the line, because it is the ende of this addition, and thus it is to be done of all suche like. And for the easier vnderstanding of that whiche wee haue spoken of addition, you maye examine these two other examples following, in the which the first hath these numbers, 3570, 2763, 579, and 28, which being added togeather, doe make this number 6940, and in the seconde Exdample, doth resulte this number 51683 by adding togeather of these numbers 47630, 3756, 272, 25, as here vnder written

written.

The numbers to be added	3570	5763
	3763	3756
	579	272
The line put betweene.	28	25
The summe of this addition.	76940	51683

Addition of Li. s. d.

But if I haue any summes, whiche are composed of diuers kindes of denominations, as 25 Li. 17 s. 4 d. and 14 Li. 13 s. 8 d. and 16 Li 19 s. 7 d. to be added togeather: I must first set downe all the sayde summes the one vnder the other, as heere you see: placing the title of poundes right vnder the pounds, the shillings vnder the shillynges, and the penies vnder the penies, keeping likewise the

Li.	s.	d.
25.	17.	4.
14.	13.	8.
16.	19.	7.
57.	19.	7.

dew-

due order of their places, in each denomination. And then I beginne at the least denomination, which are penies: And I say thus: 4 and 8 make 12, and 7 make 19 d: that is 1 s, & 7 d. I set downe 7 vnder the line against the place of penies, and I doe keepe in my minde 1 s, to bee added vnto the place of shillings: This done, I proceede to the said place of shillings, saying, 1 s, that I keepe & 7 s, are 8, and 3 are a 11, and 9 doe make 20: I put o vnder the line against 9, and doe keepe 2 in my minde, comming then vnto the tens of shillings, I say 2 that I keepe, and 1 make 3, and 1 make 4, and 1 make 5: which are 5 tens of shillings, that is to say 2 li. and 1 ten, ouer the which 1 I put behinde the o towardes the left hande, vnder the tennes of shillinges. and I doe keepe 2 li in my minde, then I come to the place of poundes, and say 2 li. that I kepe, and 5 are 7, and 4 are a 11, and 6 doe make 17 li, I do set 7 li, vnder the line against 6, and doe keepe 1 in my

minde, then comming to the tennes of poundes, I say 1 that I kepe, and 2 are 3, and 1 are 4, and 1 do make 5: the whiche 5 I write downe vnder the line behinde the 7: and so is this addition ended. And then ẏ sayd 3 summes being added togither, doe amounte to 57 li. 10 s. 7 d. And thus is to be done of all other summes, of any other denominations.

Other Examples.

225.	12.	6.	5678.	13.	9
47.	3.	9.	608.	00.	10
38.	18.	7.	400.	17.	11
5.	00.	8.	56.	18.	8
316.	15.	6	9.	12.	7
			6754.	03.	09

Of

Of ſubſtraction in whole number.

The. 3. Chapter.

Subſtraction teacheth howe you ſhal ſubſtract one leſſer number from a greater, and ſheweth what there doeth remaine after that you ſhall haue ſubſtracted the ſame, I ſpeake not of the ſubſtracting of one equall number, from an other equall vnto it, for the facilitie thereof requireth no rule.

In ſubſtraction are founde three numbers, the one is the number, from the whiche the ſubſtraction is made. The ſecond is the number that is to be ſubſtracted, and the third is the number which remayneth after ỹ ſubſtraction is ended. As when I would ſubſtract 25 from 40. The ſaid 40 is the nũber from the which the ſubſtraction is made, and 25 is the nũber to be ſubſtracted, and 15 is the number which

remayneth after you haue ended the substraction: here followeth the practise. You shall put the lesser number vnder the greater, in such sort that euery figure of the one number maie annswere vnto euery figure of the other, orderlie according to their places, and then draw a right line vnder those two numbers as you did in addition. Then must you beginne at the right hand, and take the first figure of the vndermost number, and substract that from the first figure of the vppermost number ouer it, and that which remayneth you must set vnderneath the line right vnder the figure which you haue substracted: then afterward take likewise the second figure of the nethermost number, and abate that also from the second figure of the higher number: the third frō the third, and so foorth of all the rest till you come to the end, putting alwaies the remaine of euerie figure vnder the lyne in his due order and place,

as

as by example, I will ſub- ſtract 2345, from 9876, af- ter ÿ I haue ſet thẽ downe according to the manner a- foreſaid. Thẽ beginning at	9876 2345 7531

the firſt place next to my righte hande, I take firſt 5 from 6, and there reſteth 1: which 1 I ſet vnder the line right againſt 5. Secoundlye I ſubſtracte 4 from 7, and there reſteth 3: the ſayde 3 I ſet in the ſecond place vnder the line next after 1. Thirdlye I ſubſtract 3 from 8, & there reſteth 5, the whiche 5, I put vnder the line in the thirde place next after 3. Finally I doe ſubſtract 2 from 9, and there reſteth 7: the whiche 7 I putte vnder the lyne in the fourth and laſt place next after 5, and thus is this ſubſtraction ended, in the whiche there remaineth 7531.

But when two figures of one like- neſſe do chaunce to meete, ſo that ÿ one muſt be ſubſtracted from the other, as if I ſhould ſubſtracte 7 from 7, there would remayne nothing: then muſt I ſet a Cipher 0 vnder the line. But

when the figure which is to be ſub-ſtracted doth excede the figure which is ouer him, ſo that it cannot be taken out of the ſame figure, Then muſt you ſubſtracte the vndermoſte figure from 10, and that which doth remayne you ſhall adde vnto the ſame figure which is vppermoſte. And the ſumme whiche reſulteth of them both, you ſhal ſette vnder the line. But whenſoeuer you doe borrowe any ſuche 10 of the ouer number, you muſt adde 1 vnto the next vndermoſte figure following, whiche is yet to be ſubſtracted. And there is nothing elſe to be done in ſubſtraction. Example. I will ſubſtract 93576, from 4037479, after that I haue placed my two numbers as I ought to do, I doe fyrſt ſubſtracte 6 from 9, & there reſteth 3, the I put the 3 vnder the line right vnder the 6. And ſecondlye I ſubſtract 7 from 7, and there reſteth nothing: I do therefore put a cipher 0 vnder the line righte againſt 7 in the

$$\begin{array}{r} 4037479 \\ 93576 \\ \hline 3943903 \end{array}$$

ſecond

second place. Then I come to the third place where I finde 5, which I cannot substract from the figure ouer it, which is but 4, therefore I doe substract it frō 10: as before I taught and there resteth 5, the which I doe adde with the 4 which is ouer it, and that maketh 9: I put 9 in the thirde place vnder the line, for the third fygure. Fourthly, for the 10 which I borrowed, I adde 1 vnto the nexte figure which is to bee substracted, which is 3, and they make 4: the said 4 I doe substract from the ouer figure 7, and there resteth 3, I put 3 vnder the line for the fourth figure. And then I come to the 5 place where I do find 9, which I cannot substract from the figure ouer it, which is but 3, but I doe substract 9 from 10, and there resteth 1, the which figure 1 I doe adde with 3, and they make 4: I put 4 vnder the line for the fift figure. And here is to be noted, that if it were not for ỽ at the last I did borrow 10, the substraction should haue beene en-

ded. But for because that I must (for euery such ten that I borrow) always adde 1 vnto the next lower figure following, I must therefore proceede vnto the substraction. And for because y there is no other figure followinge in the lower nūber, it shall suffice to haue kept the vnitie and to substracte it frō the next other figure. But I find there 0, and therefore I cannot substracte 1 from 0, therefore I substract it frō 10, and there resteth 9, whiche I doe put vnder the line in the sixt place; finally, for the ten which I borrowed I keepe 1 in my minde; The which I do abate from 4, & there remayneth 3, y whiche 3 I do put vnder the line in the seuēth place after 9, and the operation is thus ended.

An other example.

576084026
485675437
90408589

But if there were manye numbers to be substracted, from one number alone, then muste you firste adde those numbers

numbers together, according unto the instruction of the Chapter going before, and afterward make your subſtraction as is aboueſaide. As if I would ſubſtract theſe three ſummes, 123, 234, 456, from 98925, firſt I doe adde the three ſummes into one, and they are 813. The whiche I doe ſubſtract from 98925, and there reſteth 98112.

But if the ſummes be compoſed of diuers kinds of denominations, then you muſt beginne at the leaſt denomination next toward your right hande, and ſo ſubſtract euerie denomination frō his like if it may be ſubſtracted, if it cannot be ſubſtracted, then you muſt borrowe 1 of the nexte denomination toward your left hand, and reduce the ſame into the lyke denomination of that figure which is to be ſubſtracted, then you ſhall ſubſtracte your firſte or leaſt denomination from the ſaide ſum ſo borrowed, and that figure or number that ſhall remaine, you muſt adde with the uppermoſte number of the leaſt

least denomination, and set the aggregate vnder the line righte againste his like. Thē the 1 which you did borrow must be added with the next figure of the next denomination that is to be substracted, and so to proceede with the whole summe that is to be substracted.

Example.

I would substract 15 li. 17 s̄. 11 d. from 28 li. 13 s̄. 9 d. I doe firste putte downe the greate summe, & vnder that the lesser with a line vnder them, as here you see and then I do beginne at the least denomination, which are penies, where I say 11 penyes from 9

li.	s̄.	d.
28.	13.	9
15.	17.	11
12.	15.	10

penies I cannot, and therefore I doe borrow 1 s̄. of the next denomination, that is of the 13 s̄. the which 1 s̄ is 12 penies: then I substract 11 pennies from 12 penies, and there remayneth 1 penie, the which 1 penie I doe adde with 9 penies, and they make tenne penies, the sayd 10 I set vnder the lyne, and do keepe the 1 s̄ in my mind that I bor-

borrowed, then I come to the second denomination of shillings, where I do find 17 s, then I say 1 s that I borrowed and 17 doe make 18 s: the said 18 s out of 13 s cannot be: therefore I do borrow 1 li of the next denomination, that is to say, out of the 28 li, and the saide 1 li, are 20 s: then I substract 18 s from 20 s, and there remaineth 2 s: with the which I do add the 13 s, and they doe make 15 s: the same 15 s I set under the line, and I do kepe 1 li, to be added to the lower place of pounds: then I say 1 li that I kepe, and 5 are 6 I substract 6 li from 8 li, and there remaine 2, I set the said 2 under the line against 5: and last of all I come to the tens of pounds, where I do find 1, then I do substract that 1 from 2, and there remaineth 1: which I set under ye line, and so I find there remaineth 12 li, 15 s, 10 d and so is to be done of all other like.

Of

Of Multplication,

Chap.4.

IN multiplication there are three numbers to be noted, that is to say, the number whiche is to bee multiplied, the whiche wee will call the Multiplicande: the seconde is the number by the whiche wee doe multiplie, whiche wee will name the multiplier, or multiplicatour: And the thirde number is that whiche commeth of the multiplication of the one by the other, whiche is called the product. As when I would know howe much amounteth 10, multiplied by 9, that is to saye howe much are ten times nine: I finde that they are worth 90, then 10 is the multiplicande, and 9 is the multiplier, and 90 is called the product: So that to multiplie is none other thing, but to finde a number which conteineth the multiplicande so many times, as the multiplier conteineth vnities: As 10 multiplicand by 9, doe make 90, as before

fore is saide. And 90 conteineth 10 so many times, as 9 conteineth vnities, that is to say nine times.

In multiplication, it forceth not much which of the two numbers bee the multiplicand, nor which bee the multiplier. For 10 multiplied by 9, maketh as many as 9 multiplied by 10, yet neuerthelesse it shall bee more commodious that the lesser number be alwaies the multiplier.

And for that, the multipication of figures the one by the other, is the chiefe and necessariest kind wherby to know how to worke in the multiplication of compound numbers, and that euery man hath not the same at the fingers end, I will therefore giue you here certaine easie waies of multiplication of diget numbers. When you would multiply two simple figures, or digets the one by the other, subtract each of those diget numbers from 10. Then multiplie the two remaines the one by the other, and if the summe doe exceede 10, write onely the first figure and

and keepe the other to be added to the next operation, which is thus as followeth. Adde your two simple figures together: & of ÿ which resulteth of the additiõ, take onely the first figure, unto the which you must add ÿ unity which you did kepe before. And ÿ shall be the second figure of the sum which you doe seeke. Example. I would multiply 7 by 6. I take 7 frõ 10 & there resteth 3: likewise I substract 6 frõ 10, and there resteth 4, then I say thus, 3 times 4 make 12: I write 2 for my first figure, and I keepe 1 in my mind: then I adde 6, with 7, and they are 13: of the which I cast away the second figure towarde my left hande which is 1: and I take onely ÿ first figure 3 which is towarde my right hand, unto the which I adde the unitie which I kepe, and they make 4, which I write in the seconde place, after 2, and thus I find 42, which is the value of 7 multiplied by 6.

Otherwise, and all commeth to one effect: set down your two diget numbers the one right over the other, and right

right againſt euery of them towarde the ryght hand write his owne difference from 10: then multiply the two differences together, the figure which commeth thereof ſhall you ſet downe vnder both the differences if it be a diget number that is to ſay any number vnder 10. But if there be two figures, ſet downe but the firſt, and keepe the other in your minde, afterwardes ſubſtract (from one of the two diget numbers) that were firſt ſet down, the differēce of the other diget number, that is to ſay croſſewiſe: And vnto the remaine adde the figure which you kept before, and that ſhalbe the ſecond number: and thus you ſhall haue your multiplication. Example of yͤ ſame figures

that is to ſay of 7 multiplied by 6, the difference of 7 from 10, is 3: and the difference of 6 from 10, is 4. I ſette them downe croſways as you ſee. And then I ſaye three times 4 are 12: I ſette downe

downe 2, and keepe one in my minde, then I substract 4 from 7, or else 3 from 6, it forceth not from which of them, and there resteth alwaies 3: vnto the which I adde the vnitie which I kept in my minde, and they are 4, which shall be the second figure of the multiplication. And thus I find that 7 multiplied by 6, maketh 42: as in the other operation. This practise hath no place where the 2 diget numbers (doe not exceede 10) by adding them togither, and then is multiplication easie ynough without any rule.

An other way to know the multiplication of simple numbers, is by this table following: the vse whereof is thus.

First you shall vnderstand that the numbers frō 1, and so descending downwardes to 9, which are set in the left part or hanging margine of this table doe betoken the multipliers of all simple numbers. And the elements of figures beeing put highest, in euerie square roome drawing towarde your righ-

right hand, right against euery of the multipliers, doe signifie the multiplicands, which doe appertaine unto the multipliers of the hanging margine. And the lower or inferiour numbers in euery square roome, doe betoken the product of that multiplicatiō, which is made in multiplying the upper number ouer it, with the figure in the hanging margin, aunswering directly unto the said square, as by Example.

(∴)

D. The

The Table of Multi-

plication by all the Diget numbers.

1	1 1	2 2	3 3	4 4	5 5	6 6	7 7	8 8	9 9
2	2 4	3 6	4 8	5 10	6 12	7 14	8 16	9 18	
3	3 9	4 12	5 15	6 18	7 21	8 24	9 27		
4	4 16	5 20	6 24	7 28	8 32	9 36			
5	5 25	6 30	7 35	8 40	9 45				
6	6 36	7 42	8 48	9 54					
7	7 49	8 56	9 63						
8	8 64	9 72							
9	9 81								

First because 1 doth not multiplie, I haue set in the vpper Margin ỹ figures from 1 to 9, both in the higher and also in the inferior rowes, for 1 in the hanging Margine, multiplyed by 1, the vpper number in the first square bringeth but 1. So likewise 2, being the higher number in the secõd square of the vpper margin, multipled by 1 in ỹ hanging margin bringeth 2 for the lower number in ỹ second square of the vpper margine. For 1 times 1, maketh but 1. And 1 times 2 maketh 2. Then 1 times 3 maketh 3, and 1 times 4 maketh 4. & so continuing toward the right hand, vntill I come to ỹ figure of 9. which is 1 times 9 maketh 9. Then afterwards I multiplie 2 of the hanging margine by 2, which is the vpper number of the square next toward the right hand, & ỹ maketh 4, which is the product of 2 multiplied by 2, that 4 I set vnder the 2, for 2 times 2 are 4, and 2 times 3 maketh 6, then 2 times 4 maketh 8, and 2 times 5 maketh 10, and so

continuing unto 2 times 9, which maketh 18. The like is to be done with the third row, and so likewise of all y residue.

Example, I would know what is the product of 9, multiplyed by 8, I seeke in y hanging margin, the multiplier 8, and amongst the squares directly against 8, drawing toward the right hand, I seeke the multiplicand 9, in the higher rowe, and I find the product right under 9, to be 72, then 72 is the number which commeth of the multiplication of 9 by 8. And so is to be understanded of all the rest of the table, which table must be of all men learned by heart, or as they say, without booke: which being learned, you shall the better attaine to the rest of multiplication.

To come now unto the practise of multiplication, when you would multiplie two numbers, the one by the other you must set them down after the same manner as you did in addition, and in substraction, that is to say, the

first figure of the multiplier vnder the first figure of the multiplicande, the seconde vnder the seconde, and the thirde vnder the third, if ther be so many, and then drawe a right line vnder them, as in the other operations going before, after this you shal multiplie all the figures of the multiplicãd by the multiplier, and set downe the figures (comming of any such multiplicatiõ) vnder the line, every one in their due order & place.

Example, I would multiply 123 by 3, that is to say, I would knowe howe much amounteth three times one hundreth, twenty & three. The two numbers being placed in suche order as is beforesayd, you muste beginne towards the right hand: and saye thus, three times 3 are 9: wryte downe 9 vnder the line, righte against 3, for the first figure: secondelye by the same 3, you must multiply the second figure 2, and they make 6, put downe 6 after the 9, vnder the line: Thirdlye by the same

$$\begin{array}{r} 123 \\ 3 \\ \hline 369 \end{array}$$

3, you shall multiply the last figure 1, and they are but 3, set downe 3 after 6 for the third and last figure. And thus is the worke ended: wherby you shall finde that 123 being multiplyed by 3, maketh 369.

But when it happeneth that of the multiplication of one figure by an other, the summe which commeth thereof shall be of two figures as it happeneth often, then shall you write down the first figure, and keepe the other figure to be added unto the multiplication of the next figure.

Example. 6 men haue gained (euerie one of them) 345 Crownes; I would knowe howe manie Crownes they had in al. First I multiplie 6 by 5, they make 30. I write 0 vnder the line, and for 30 I doe keepe 3 to be added to the next multiplication: Secondly I say, 6 times 4 are 24: vnto the which I adde 3, which before I reserued, and they make 27. I write 7 in the second place vnder

$$\begin{array}{r} 345 \\ 6 \\ \hline 2070 \end{array}$$

vnder the line, and I keepe 2, to be added to the next multiplication: Thirdly I say 6 times three are 18, vnto the which I adde the 2 which I keepe, and they make 20, the which I write all downe, for because that is the last worke. And so I find that 345 being multiplied by 6, doe make 2070. But when the multiplier is of manie figures, you must multiply all ẏ whole multiplicand by euery one of those figures, & write the products euery one orderly vnder his owne figure.

Example, I would knowe how many daies are past from the Natiuitie of Jesus Christ vntill the yeare 1560 full complete. I must now multiplie 1560, by 365 dayes, because there are so many dayes in one whole yeare, the leape yeares not being reckened, which haue euery one of them 366 daies.

Therefore first by the figure 5: I multiplie all the higher figures saying this, 5 times 0, ma-

$$\begin{array}{r} 1560 \\ \underline{365} \\ 7800 \end{array}$$

keth 0: I write 0, vnder the line for the first figure, and because I keepe nothing for the next place, I proceede and say, 5 times 6 are 30: I set 0 vnder the line for the second figure, and I keepe 3 to be added to the next multiplication: Thirdly I say, 5 times 5 are 25: The which with the 3 that I keepe are 28: I sette downe 8 for the third figure, and keepe 2 to be added with the next multiplication: Then comming vnto the fourth and laste figure, I say 5 times 1, are 5: the which with the 2 y I reserued are 7, I put 7 for the last figure of this first worke by the figure 5, with the which figure I haue no more to doe. And therefore I cancell the same 5 with a litle strike thorow it, to signifie that I haue finished with that figure, & for as muche that in multiplication there is alwaies as many simple operations, as the multiplyer conteineth figures. There resteth yet 2 works to be made, I come therefore vnto the second worke which is y figure 6, by y which I must again multiply all the figures of the multy-

plicande as I did by 5, and the first figure (which shall be produced) I doe put one ranke more lower then the figures of the worke nowe last made by 5 not right under the first figure of the multiplier 5, but under 6, that is to sai one degree or place nearer toward the left hand: and one ranke more lower then the firste worke: and I must put afterward every of the other figures which commeth of the same multiplication in their order, thirdly I doe make the multiplication by the third figure & that which shal come thereof I must set in his ranke, as hereafter shall appeare. And now I neede make no further discourse hereof, because that hee which can doe the firste multiplication by 5, may as easily do all the others: it shal therfore suffice to set hereunder the examples of al the sundry wayes.

1560	1560		1560
5	65		365
7800	7800		7800
	9360		9360
	101400		4680
			569400

Nowe, if you will knowe howe muche all the three workinges, thus placed do amount vnto, which in value must be but one number, you must add all the numbers which are come of all the 3 multiplicatiõs together, but not after the same maner as we haue done in the chapter of addition, the firste figure of the first ranke with the first figure of the second ranke, and so of the third, but you must add thẽ in the same sort as you shall find them situated and placed, that is to say, the first figure of the first ranke alone by it selfe: the seconde of the first ranke, with the firste of the second ranke. The third of the first rank with the second figure of the seconde ranke, and with the first of the third ranke, and so of all the other as hereafter doth appeare.

And thus the 1560 yeares doe contayne fyue hundred sixty and nine thousande foure hundred dayes, not counting herein the

	1560
	365
	7800
	9360
	4680
	569400
	dayes

dayes of the leape yeares, which are here in number 390, for thē the whole summe of the days should be 569790.

An other Example.

34560
2456
207360
172800
138240
69120
84879360

The summe of multiplication is thus, when you would multiplye any number by 10, you shall only put one cipher 0 before all the numbers, that is to say, a degree nearer ẏ right hand, as 345 multiplyed by 10, maketh 3450. If you wil multiplie any nūber by 100, adde unto the same nūber two ciphers thus 00, if by 1000 adde 000. And to be briefe, when the last figure of the multiplier is 1, and all the reste be ciphers, adde so manye Ciphers to your multiplicande, as there shall bee found

found ciphers in your multiplier, but if in my multiplying, the last fygure were not 1, but that there were onlye certaine Ciphers in the beginning: and that the other were signifying fygures, and likewise those of the multiplicand, thē shal you put those ciphers apart, and multiplie the signifying fygures of the one, by the signifying fygures of the other. Then add unto the product of that multiplication, all the ciphers whiche you didde before put apart. As if I would multiplie 46000, by 3500, I put apart the three ciphers of the first, and the two ciphers of the second numbers which are in al 5 Ciphers 00000: And then I multiplye 46 by 35, and thereof commeth 1610: Before the which towarde the righte hand, I adde the 00000 that I did put apart, and then the whole product will be 161000000.

	46
	35
	230
	138
	161000000

Of

Of diuision,
Chapter 5.

DEuision or partition is to seeke howe manye times one number doth conteine another, or else howe often times one number maye bee found in another, for in the worke of deuision there are required two numbers to bee first knowne, for the finding out of the third. The first number knowne, is called the deuidend number which is to be deuided, and that must bee the greater number: the seconde number is called the deuisor, and that is the lesser. And the third number which I doe seeke, is called the quotient. As if I would deuide 36 by 9, the deuidend shal be 36: and the deuisor is 9. And for because that 9 is conteined in 36 foure times that is to say, 4 times 9, doe make 36: The quotient shall bee 4, as if you worke well, how many times 9 is conteyned

teined in 36, you shall find it 4 times, and therefore 4 shall be the quotient.

The Practise.

Write downe first the deuidend for the higher number, and the deuisour underneath, in such sort that the first figure of the deuisour toward the left hand, be under the first figure of the deuidend, and euery figure of the same deuisor under his like, that is to say the first under the first, the second under the second, the third under the third, and so consequentlie of the other, if there be so manie, which is contrarie to the other three kindes before specified, but yet you must consider further if all the lower figures of the deuisor may be taken out of the higher figures of the deuidend, by the order of subtraction or not. The which if you cannot do then must you set the first figure of the Deuisor (towarde the left hand) under the second figure of the deuidend, and so consequentlie the rest in their due order, if anie bee to bee set

downe

downe euery one of them vnder his lyke as before is saide, and then draw a line betweene the deuidend and the deuisor. And at the end of them an o- ther crooked line, behinde the which toward the right hande, shall bee set your quotient. As by this Example following, where the deuisor is but of one figure.

If you would deuide 860, by 4, you must set downe 4 vnder the 8, with a line betweene them, as here vnder you may see.

The deuidend.	860
Deuisor.	4

And then you must seeke how many times the deuisor 4 is conteined in the higher number, that is to say 860, the deuidende aunswering to him, as in this our exãple I must seeke how ma- ny tymes 4 is conteined in 8, in the which I find it 2 times, then I write down 2 apart, behind the crooked line as here you may see, which shalbe the first figure of the quotient to come, se- condlie by this figure 2 (beeing

thus

thus put apart) I must mul- 8 6
tiplie the diuisor 4 and vn- 4
der the same multiplication, I 8
must seeke that number which
baileth of the same multiplication,
2 times 4 do make 8, the which 8 I
set vnder the diuisor 4. Thirdly I
subtract the product of the sayd mul-
tiplication (of the quotient by the diui-
sor) that is to say, 8 from the higher
der correspondent to the same, in sayin
8 from 8, there remaineth nothing, a
then I cancell or strike out that whi
is done as you see; in these three op
rations and workes is comprehend
the arte of diuision. The which are
be obserued from poynte to poynte,
there is no diuersitie in the finishing
the same which is thus.

Now secondly I must remoue m
Diuisor one place nearer towarde
right hand, as in proceeding
with one exaple. Here you 2
see I remoue my diuisor 4, 8 6 0 (
whiche was vnder 8, and I 4
set it vnder 6, then I seeke how man

conteined in 6 : where I finde it but one time, then I set 1 behind the crooked line next vnto the first figure of the quotient 2, a degree or place nearer my right hand, afterward by this last and new figure 1, I multiply the deuisor 4, and that maketh but 4 (for an vnity, which is but 1, increaseth nothing) I abate therefore 4 from the higher fygure 6, and there resteth 2, the which 2 I set ouer the 6, and I cancell the 6, for so must I doe when there resteth any thing, after I haue made the substraction. Thirdly forasmuch as there yet remaineth an other figure in the diuidend, I remoue againe the deuisor, & I set it vnder the cipher 0. Then I seeke how many times 4 is in the higher number which is 20, where I may finde it 5 times, I put therefore 5 behind the croked line for the third and last fygure of the quotiēt. Thē by the same 5. I multiplie ẏ deuisor 4, & that maketh 20, the which 20 I a-

$$\begin{array}{l} \quad 2 \\ \cancel{8}\,\cancel{6}\,0\,(215 \\ \quad 4 \\ \quad \cancel{2}\,\cancel{0} \end{array}$$

bate from the higher number, & there resteth nothing: and so is this deuision ended: & thus I haue found that 860, being deuided by 4, bringeth for the quotient 215, that is to say, that 4 is conteined in 860, two hundred and fifteene times. This is the most easiest working that in is deuision, but that which followeth, appertaineth to the whole and perfect vnderstanding of the same, when the first figure of your deuisor toward your left hande is greater then ẏ first of the deuidend, you must not place the first figure of your deuisor right vnderneath the first of the deuidend, but vnder the second figure of the same deuidend, nearer to your right hand, as before is saide. Therfore whē ẏ deuisor is of many figures, & that you haue to seke how many times it is conteined in the higher number (for the more easier working) you must not seeke to abate the deuisor all at one time, but you must see and marke how many times the figure of the same toward the left hand is conteined

teined in the higher number aunswe-
ring to the sayd number, and then to
worke after the same maner as is be-
fore taught.

Example. I haue 31621 5 crownes
to be deuided among 45 men, and for
to make my diuisiõ I must not put the
first figure of the diuisor, whiche is
4, vnder the first of the diuidend, which
is 3, because that 4 is greater number
than 3. And further, you knowe
that I cannot take 4 out of 3, wher-
fore I must set the 4 vnder the seconde
fygure of the higher number, that is
to say, vnder 1, and the figure 5, of the
diuisor right vnder the 6, as here you
may see.

So that I must first seeke how many times 45, is cõteined in 316, whiche is but parte of the diuidende.

3 1 6 2 1 5
4 5

Wherfore for the more easie working
I need but to seeke howe manye times
4 is contained in 31. And because I
may haue it 7 times, I put 7 behinde
the crooked line, as is aforesayd: then

by 7, I multiply all the deuisor 45, and they are 315: the which I set vnder the same deuisor, the first figure vnder the fyrst: and the other in order towarde the left hande. Then I substract 315 from the higher number 316, and of this firste working there remaineth but 1, the which I set vnder the 6, and I can-cell likewise the 315, and the other figures 316, and also the deui-sor 45: and then it will stand thus, as in the margent.

1	
316215	
45	(7
315	

And when I come to remoue the deuisor, and that I must seeke howe many times it is conteined in the higher number, if I see that I cannot finde it there, that is to say, that if the higher number be lesser then the deui-sor, as it is in this example, then must I put a cipher in the quotient behind the crooked line, and if there remaine any figures in the deuidend which are not yet finished: I must remoue the deuisor againe neere toward my right hand

hande by one place, for to finde a newe figure in the quotient. As in this owne example, for after that I haue remoo-ued the diuisor, I seke how many times 45 is contayned in 12, and because I cannot haue 45 in 12, I put a 0 behinde the crooked line after 7: then without multiplying or abating, I remoue agayne the diuisor nearer towarde my righte hande, and I seeke how many times 4, (which is the firste figure of the diuisor) is in the higher number, ẏ is to say, in 12, whereas I finde it 3 times: I put 3 behinde the croked lyne for the third figure of the quotient: then by the same figure 3, I multiply the diuisor 45, and thereof commeth 135. And in the number o-uer it there is but 121, so that I cãnot take it out of 121, which is the lesser number. And therefore here is to bee

1
3 1 6 2 1 5
45 (70

1
3 1 6 2 1 5 1
45 (703
135

noted, that if it happen that the figure being last founde whiche is put in the quotient, doe produce or bring foorth a greater number: (in multiplying all the diuisor by the same) thē the whiche is ouer the sayd diuisor: you must then make the same figure of your quotient (which you doe put downe) lesser by 1, and after that you haue cancelled the first multiplication you must make a newe. And the same must be done so often times: as (in decreasing the same) it may produce a lesser number, or at the least, a number equall to that which is ouer it, as it in the last work, for because that the diuisor, being multiplyed by 3. bringing foorth 135, whiche amounteth more then 121. Therefore the same product must bee cancelled, and the figure 3 whiche I did put in the quotient, must bee also chaunged into a figure of 2. Then by the sayd 2 I muste multiplie the diuisor 45, and thereof commeth 90, the which I abate from 121, and there remaineth 31, And then wil the summe

stande

stand thus, as followeth.

```
   1 3
  3 1 6 2 1 5
     4 5       2
    2 3 5    (703
     0 0
```

And here is also to bee noted, that the summe which remaineth must bee alwayes lesser then the diuisor. Then finally I remoue the Diuisor to the 2 next figures toward the right hande, and I seeke howe many times 4 is in 31, & for because I finde it 8 times, I put 7 in ẏ quotient, by ẏ which I mul tiplie the diuisor, and thereof commeth 315, the which I abate frō the higher number of the diuidende, and there remaineth nothing, as here you may see.

```
   1 3
  3 1 6 2 1 5
      4 5      (7027
     3 1 5
```

But if it happen that after the diui-

sion is ended, there doe remayne any thing in the Diuidend, as often times there doeth: I must also set them that remayn apart behind the crooked line, after the entire quotient, and the diuisor right vnder the same remain, with a line between them both. And in this diuisor following, where there remaineth 3 in the last worke. And what the same doth signifie shal be taughte vnto you, when I shal treate of fractions or broken numbers.

i.	ii.
1 1	1 1
4 6 7 8 5 9	4 6 7 8 5 9 (10
4 5 6 (1	4 5 6

vi.	iiii.	
2	2	
1 1 7 3	1 1 7 3 3	
4 6 7 8 5 9	4 6 7 8 5 9	$\frac{3}{456}$
4 5 6	4 5 6	(1026.
9 1 2 (102.	2 7 3 6	

In summe, all the whole practise of diuision

diuision may be kept in remembrance by three letters, that is to say, S, M, and A, which three letters doe signifie, to seeke, to multiply, and to abate.

First I must seeke how many times the diuisor is contained in the higher number: then by the quotient (whiche I finde) I must multiplie the diuisor: finally, I must abate the product of the multiplication, from the higher number correspondent to the same, that is to say, out of the diuidend, answering to the diuisor.

And further, besides this kinde of working in diuision. The whiche is regular and commune: I wil here put another maner of working very easie. The which shall serue for suche diuisions as are more difficil to be wrought. That is to wit, whē the number to be diuided is very great, and the Diuisor great also, and it shal serue agayne for to auoyde errour in supputation, and for the placing of fewer figures in the quotient: and consequently it shal saue much

much labour vnto them which as yet haue not much studied in this Arte. The practise whereof is thus as followeth.

If you would deuide 7894658 by 643. First you shall vnderstand, that although the figure of the deuisor toward your left hand, maye be found many times in the higher number, as 10 times, 12 times, or more: yet is it so, that you must neuer put but one figure onely at a time in your quotient. And you shall at no time put any number in your quotient which exceedeth the figure of 9, that is to say, any number being greater then 9, and therfore for to come vnto your practise, wryte downe your deuisor one time, and behinde it towarde your right hande, draw a line downe straight, and right against the same deuisor behind the line toward the right hand, put this figure 1. Then double your said deuisor and right against the same which you haue doubled, put behind the line the figure of 2, This done you shall adde vnto

vnto the same number that you doubled your saide deuisor, & right against the same product, behind the line you shall put the figure of 3, and vnto this thirde product, you must adde againe your deuisor, and right against the same product behynde the line, set the figure 4, And this must you doe, vntill you come to the figure of 9, in such sort that euery of the products doe surmount so much his former number, as all the deuisor doth amount vnto, placing at the right side of euery product behind the line, the number which signifieth how much he is in order, that is to say, right against the fift product, you must put 5, and right against the 6 product, you must put 6 : And so likewise of all the other.

The Example following in
the next paage.

Example

Example of the diuisor proponed 643: Fyrste of al I write downe 643 & right agains ŷ same behind the line toward my right hand I put 1: secondly, I doble 643 and they make 1286: & right against the sum behind the line I put 2: thirdly, unto the same 1281, I ad the diuisor 643, and they are 1929, and right against the same I set 3. Fourthly, unto the sayne 1929, I adde the Diuisor 643, and they make 2572: and right agaynst the same I put 4. And thus must you doe alwaies by increasing so much euery product as ŷ diuisor doth amount unto, until you haue so done nine times, as you see in this present Table.

643	1
1286	2
1929	3
2572	4
3815	5
3858	6
4501	7
5144	8
5787	9

This being done, you muste sette downe your Diuisor under the Diui-

dende

dend 7894658, after the same maner as is before declared, ẏ is to say, 643, vnder the first three figures of the deuidend toward your right hand, namely vnder 789. Then must you seeke how many times 643, are conteined in 789: And for to know the same, you must looke in the foresaide Table, if you may there finde the same number 789, the which is not there. Therefore you must take a lesse number, the nearest to it in quantitie that you can finde in the table, the whiche is 943, 643
which number hath against it on the right hande of the line, this diget 1: Then take the saide 1, and put it behinde the crooked line for the firste figure of the quotient.

Then you must abate 643, from 789, and there will remaine 146, the same shall you put ouer the 789, and cancell the 789: and thus is the firste worke ended. Then set foreward the deuisor, one figure nearer your right hande, and seeke a newe quotient as you sought this, where you finde the

higher

higher number ouer your diuisor to be 1464. The which seeke in the table, and for because you cănot find it there, you must take a lesser nũber, the nighest to it that you can finde, and that is 1286: which number hath againste it this diget 2. Therefore you muste put 2 for the second figure of the quotient behind the line, and then abate 1286, from the sayd 1464, and there wil remayne 178. Thirdly, remoue forward the diuisor as you did before, and you shall fynde the higher number ouer it to be 1586, so that the next lesser number to it in your table, is again 1286, put therefore once againe 2 in the quotient for the thirde figure: and abate the sayd 1286, from 1786, so there wil remaine 500.

Fourthly, set forward the diuisor, and the higher number ouer it, is 5005, & the next lesser number to it in your table, is 4501, right againste the whiche is 7, put 7 in ẏ quotient for the fourth figure. And after that you haue abated 4501, from 5005, there will re-

mayne

maine 504, Finally remooue towarꝺ your deuisoꝛ vnto the last place, anꝺ you shall finꝺ the higher number ouer it to be 5048. Anꝺ the next lesser nu.n-ber to it in your table, is 4501 Ther-foꝛe set 7 againe in the quotient foꝛ ẏ fift & last figure. Then substract 4501, from 5048, & there will remaine 547: which must bee put at the enꝺe of the whole quotient with the ꝺeuisoꝛ vnꝺer it, anꝺ a line betweene them in this maner following.

(12277. $\frac{547}{645}$

The summe of Deuision.

WHEN you woulꝺ ꝺeuiꝺe anie number by 10, you must make away the last figure nexte towarꝺes your right hanꝺe, anꝺ the rest shall be the quotient. Example. As if you woulꝺ ꝺeuiꝺe 46845 by 10, take a-way the 5, anꝺ then 4684 shall be the quotient, anꝺ the 5 shal be the number that ꝺoth remaine. Likewise when you woulꝺe ꝺeuiꝺe anye number by

100. take away the two last figures towards your right hand, and if you would deuide by 1000, take away three figures, if by 10000, take away foure figures. And so of all other, whē the first figure of the deuisor towarde the left hande shall be onely 1, and the rest of the same deuisor being but ciphers.

Heere follow the proofes

of Addition, Substraction, Multiplication, and *Deuision.*

The proofe of Addition.

WHEN you woulde prooue whether your Addition bee well made, consider the figures of the numbers whiche bee added euery one in his simple vallue, not hauing any regarde to the place where he standeth, but to recken him as though he were alone by himselfe, and then recken them all one after another, casting away from them the numbe

number of 9, as ofte as you may. And after your discourse made, keepe in mind the same figure which remayneth after the nines be taken awaye: or else set the same in a voyde place at the upper end of a line. For if your addition be wel made, the like figure wil remain, after that you haue taken awaye all the nines out of the totall summe of the same addition, as oftē times as you maye there finde any: as in this addition which here you see, there remaineth 2 for eche part.

24567	2
5329	
481	
30377	2

The proofe of Substraction.

Adde the number whiche you doe substract unto that number which remayneth after the substraction is made, and if the totall summe of that addition, be like unto the number frō the which the substraction was made,

you haue done well o-
therwise not: as in this
example doth appeare,
where you see the num-
ber which is to be sub-
tracted from 5463, is
3584, & the nũber which doth remain,
is 1879, the which two summes being
added together, doe make 5463, which
is like to the higher number, out of the
which the substraction was made, as
before is sayd.

4563
3584
1879
5463

The proofe of Multiplication.

The profe of multiplication is made by the helpe of diuision. For if you diuide the nũber produced of the multiplication, by the multiplier, you shal finde the higher number which is the multiplicand.

The proofe of Diuision.

To know if your diuision bee well made: you must multiplie all the quotient by your diuisor, and if anye thing doe remaine after your diuision is made, the same shall you adde vn-

to the product which commeth of the multiplication, and you ſhall finde the like number vnto your deuidend, if you haue well deuided, otherwiſe not.

Of progreſſion.

Chap. 6.

Progreſſion arithmeticall is a breefe and ſpeedie aſſembling or adding together of diuers figures, or numbers, euery one ſurmounting the other continually by equall difference, as 1, 2, 3, 4, 5, &c. heare the difference from the firſt, to the ſecond is but of 1, & ſo do all the other euery one exceede his former figure by 1, ſtill to the end. Likewiſe 2, 4, 6, 8, &c. doe proceede by the difference of 2. Alſo 3, 6, 9, 12, &c. doe euery one differ from other by 3. And ſo may theſe numbers continue, infinitelie after this order, in adding vnto ÿ third nūber the quantity wherin ÿ ſecond doth differ frō the firſt: likewiſe adding the ſame difference vnto the fourth number, alſo to the fift, & ſo vnto al the other: as 1, 4, the difference of the ſecond to the firſt is 3, adde *Progreſſiō Arithmeticall.*

3 vnto 4, and they are 7 for the thyrde number. Then adde 3 vnto 7, and they make 10 for the fourth number, and so of all other.

Then if you will adde quickly the number of any progression, you shall doe thus, first tell how many numbers there are, & write their summe downe by it selfe, as in this exãple, 2, 5, 8, 11, & 14, where the number of their places, are 5, as you may see, therfore you must set downe 5 in a place alone, as I haue done here in the margent. Then shall you adde the first number and the last together, which in this example are 14 and 2, and they make 16, take halfe thereof which is 8, and multiply it by the 5, which I noted in the margent, for the number of the places, and the summe which amounteth of that multiplication, is the iust summe of all those figures added together. As in this example 8 multiplied by 5, doe make 40, and that is the totall summe of all the figures. Another example of parcels ŷ are euen as thus, 1, 2, 3, 4, 5,

and

and 6. So that in this example you muſt likewiſe note downe the number of the places, as before is taught, and then adde together the laſt number and the firſt, and ẏ ſumme which commeth of that addition, ſhall you multiplie by halfe the number of the places which before are noted, and that which reſulteth of the ſame multiplication, is the whole ſumme of al thoſe figures, as in this former example, where the nūber of places is 6, I note the 6 aparte, and then I adde 6 and 1 together: which are the laſt and firſt numbers, and they make 7, the which I multiply by 3, which is halfe the number of places, and they make 21, and to ſo much amounteth all thoſe figures added together.

Queſtions done by Progreſſions Arithmeticall.

1. A Marchant hath ſold 100 kerſies after this manner following, that is to ſay, the firſt peece for

1 s̄,the second peece for 2 s̄, the thirde
for 3 s̄,and so forth, rising 1 s̄ in euery
peece of kersey vnto the hūdred peece.
The question is to know,how much he
shall receiue for the sayd 100 peeces of
kerseis? Aunswere. It behoueth you
to know the additiō of the 100 termes
in this progression: And therefore you
must adde 1 s̄,which is the price of the
first peece,with 100 s̄,which is ỹ price
of the last peece,and thereof commeth
101:the same 101 you must multiplie
by halfe the number of places, that is
to say, by 50, and thereof commeth
5050 s̄, whiche being deuided by
20 s̄,thereof wil come 252 li,10 s̄,0 d.
whiche is 2 li,10 s̄,6 d,a peece, one w
an other. Thus the 100 kersies are
solde by the sayde marchaunte for 252
li,10 s̄,0 d. The practise followeth.

101
1 ‖ 1 1
105 ‖ ~~5050~~ (252 li. 10. s̄.
50 ‖ ~~2220~~
5050

Questi

Questions of Progression.

2 I would lay 100 stones or other things in a right line, & euery of the said stones to be a iust pace one frõ an other, and one pace of from the first stone, there standeth a basket. I demaund how many paces a man shal go in gathering vp the said stones, and bearing them vnto the basket, the one stone after the other? Answere. First when he fetcheth the first stone & putteth it into the basket, hee maketh 2 paces, for the second 4 paces, for the third 6, for the fourth 8: and so forth vnto ye last stone: wherefore the last terme shall be 200: vnto the which you must add the first terme which is 2, and they make 220, whereof the halfe is ~~110~~, 101 the which you shall multiplie by 100, which is the number of the termes in your progression: or else multiply 202 by 50, which is halfe the number of places, and therof will come 10100 paces, and so many paces shall he goe in all.

Queſtions of Progreſſions Arithmeticall.

3. There is a meſſenger whiche goeth euery day 8 myles: an other man foloweth him incõtinently, & he goeth the firſt day 1 mile, the secõd day 2 mile, the thyrde day 3 myles, and ſo encreaſing his iourney euerie day one myle, by natural progreſſion. The queſtion is to know, in how manie daies the seconde man ſhall haue ouertaken the firſt. Aunſwere, you muſte conſider that 8 is the middle or halfe as well of the tearmes, as of the number of the daies: And therefore double 8, therof cõmeth 16: Subſtract 1, and there will remaine 15: and in ſo many daies ſhall he haue ouertaken the firſt meſſenger, the proofe thereof is very eaſie. If the ſecond had gone the firſt day 2 myles, the ſeconde day 4 miles, the third day 6 myles, and ſo increaſing euery daye his iorney, by 2, in how many dayes ſhould he haue ouertaken the firſt man, for to

doe this, you must perceiue that 8 is the middle & fourth terme. Therfore double 4, and they make 8, from the which substract 1, and there remaineth 7, and in so many daies he should haue ouertaken him.

Questions of Progression Arithmeticall.

4. There is one man departeth frō London to Chester, and so to Carnaruan, the distance being about 200 miles: He goeth ẏ first day 1 mile, the second day 2 miles, the third day 3: and so orderly by naturall progression. Another man departeth at the same instant from Carnaruan to London, and goeth the first day 2 miles: the second day 4 miles, the thyrd day 6 miles, and so encreasing euery day 2 myles. The questiō is to know in how manie daies they two persons shall meete together.

Aunswere, First you must consider that he which goeth by Progressyon naturall

natural, maketh but half the way tha the other doeth, so that he shall haue made but the one third part of the way at their meeting together. Take there fore the $\frac{1}{3}$ part of 200, and you shal haue $66\frac{2}{3}$. Then must you seeke 2 nū bers, whereof the greater of them, may be double vnto the other, lesse 1: and that the one of them being multiplied by the other, the product of them may be $66\frac{2}{3}$, or little more, so that the more do not exceede the value of the greater terme, as here in this question the two nearest numbers are 12, and $6\frac{1}{2}$, which multiplied ye one by the other, do mak 78, which is $11\frac{1}{3}$ more then is $66\frac{2}{3}$ wherefore that day when they shoul meete together, the first had done but $\frac{2}{3}$ of a mile of his iorney, which was vp the 12 day, then if ye will know wha part of a day that they did meete, you must deuide $\frac{2}{3}$ by 12, and you shall find $\frac{1}{18}$, of a day. Therefore in 11 dayes and $\frac{1}{18}$ part of a daye, that is vppon the twelfth day, they shall meete toge ther.

5 If any man doe owe mee 1000 crownes, to bee payde in 20 dayes, or termes, by Arithmetical progression. The questiō is, to know with what number he shall begin and continue his progression? Answere: To do this you must adde 1 vnto 20, And they make 21, the whiche you shall multiplie by 10, whiche is halfe the number of places, and therof commeth 210, and therfore diuide 1000, by 210, and thereof will come $4\frac{16}{21}$, the payment of the first day, and by this number doth the sayd progression encrease, in this sort following: $4\frac{16}{21}$, $9\frac{11}{21}$, $14\frac{6}{21}$, $19\frac{1}{21}$, &c. And so of all others.

A man oweth me 400 li, to be payde in 10 yeres, by progression Arithmetical, that is to say, 40 li, at the end of the first yeare, and euerye yeare following 40 li, to the ende of 10 yeares: he offereth to pay me the sayd 400 li, al at one payment. The question is to know, at what time he oughte to paye me the same at one paymente, that I

be

be not interessed in the time? *Answere,* Adde 1 vnto the number of the termes which are 10, & they make 11, wherof you must take the halfe, ỷ is to say $5\frac{1}{2}$: Therfore he must pay me at 5 yeare & $\frac{1}{2}$ ỷ saide 400 li. al at one time, for that which he paieth before, is equall to the which remaineth vnpaide.

This rule hath place onely when ỷ payments are equall. But if it happen that the last paiment be lesser then the others, you must in this case put ỷ last paiment ouer one of the others for to make therof a fraction, the which must be added vnto the nūber of the termes, & the halfe of the said sum being taken shall shew the time ỷ the said paiment ought to be paid at once, as if the said partie did owe me but 380 li. to be paid euery yere 40 li. it is certain that he must haue 10 yeares to end the paiments. And it is true that vppon the 10 day there would remaine but 20 li to be paide: And therfore put 20 ouer 40 in this sort, $\frac{20}{40}$, and that maketh $\frac{1}{2}$ which you shal add vnto the number of termes, and you shal haue $10\frac{1}{2}$, wher-

of the halfe which is $5\frac{1}{4}$, doeth shewe that he must pay the sayd 380 li, at 5 yeares $\frac{1}{4}$, al at one payment, and so of all such like.

Progression Geometricall is when the second number conteineth the first in any proportion: as 2, 3, or 4 tymes, and so forth. And in like proportion shal the third number contayne the second, and the fourth number contayne the third, and the fift the fourth, &c. As 2, 4, 8, 16, 32, 64: here the proportion is double.

Likewise 3, 9, 27, 81, and 243, are in triple proportion.

And 2, 8, 34, 128, and 512, are in proportion quadruple.

That is to say, in the first example, when the proportion is double, euerye number conteyneth the other 2 times, as 4 conteineth 2, two times: 8 conteineth 4 two times, &c. In the second example of triple proportion, the numbers exceede eche other three tymes. And the third example, the numbers exceede eche other foure times, & thus you

you see that progression Arithmeticall differeth from progression Geometricall, for that, that in progression Arithmeticall, the excesse is onely in quantitie, but in progression Geometricall, the excesse is in proportion.

Now if you will easily find the sum of any such numbers, you shall do thus consider by what number they be multiplied, whether they be multiplied by 2, 3, 4, 5, or by any other, and by the same number you must multiply the the last summe in progression, and from the product of the same multiplication, you shall abate the first number of the progression. And that which remaineth of the saide multiplication, you shall deuide by 1 lesse then was ẏ nūber by ẏ which you did multiply, & ẏ quotient shal shew you the sum of al ẏ nūbers in any progression. As in this exāple, 5, 15, 45, 135, & 405, which are in triple proportiō: now must you multiply 405, which is the last nūber, by 3 because they are in triple proportion, and they are 1215, from the which

you shall abate the first number of the progression which is 5, & there remaineth 1210, the which you shall deuide by a number lesse by 1 then that was, by the which you did multiply, that is to say, by 2 and you shall find in the quotient 605, which is the totall sum of the numbers of that progression. Likewise 4, 16, 64, 256 and 1024, which are in proportion quadruple: therefore you shall multiply 1024 by 4, and therof will come 4096 from the which abate the first number 4, & there will remaine 4092. The which you must deuide by 3, and you shall finde in your quotient, 1364, which is ẏ totall summe of that progression, and this shall be sufficient for progression.

A question of progression Geometricall.

A Marchant hath solde 15 yeardes of Satten, the first yeard for 1 s̄, the second 2 s̄, the third 4 s̄, the fourth 8 s̄, and so encreasing by double progression Geometricall. The question is

is to know, how muche the sayde marchant shal receiue for ỳ sayd 15 yards of satten? *Answere.* First it is needefull to knowe how muche the whole numbers of the sayd progression doe amoũt vnto together. And for to doe it you must finde the last tearme, therfore you muste set downe the sayde progression vnto the 8 terme, whiche is 128: the which you shall multiplie by it selfe, & thereof commeth the fifteenth terme, that is to say, 16384: the same shall you multiply by 2, for because the progression is double. And thereof will come 32768, frõ the whiche you must substract the first terme, which is 1. And the rest being 32767, is the iust summe of the 15 termes: and cõsequẽtly the 15 yards of satten shal be worth 32767 shillings, the which are 1636 li 7 s.

The

The vii Chapter treateth of the rule *of three, called the golden rule: or the rule of foure Proportionalles.*

THE rule of three is the cheefest, ye most profitable, and the most excellent rule of all the rules of Arithmeticke. For all other rules haue neede of it, and it passeth all other, for the which cause it is saide that the Philosophers did name it the goldē rule, and after others opinion and iudgement, it is called the rule of proportion of foure numbers. But now in these latter daies, by vs it is called the rule of three, because it requireth three numbers in his operatiō, Of ye which three numbers, the two first are set in a certaine proportiō, & in such proportion as they be stablished, this rule serueth to find out vnto ye third nūber, the fourth nūber to him proportioned, in such sort as the second is proportioned vnto the first. Not for that, that the foure numbers, nor yet the three, are or be propor-

cionall, or set in one proportion, but such proportion as is from the first to the second, ought to be from the thirde vnto the fourth, that is to say, if the second number doe conteine the first two times or more, so many tymes shall the fourth number conteine the third. And note well that the first number & the third, in euery rule of three ought and must be alwaies of like denomination, and of one condition and nature. And the second number, & the fourth, must likewise be of one semblance and likenesse, and are dissemblant and contrary to the other two numbers: that is to say, to the first, & the third. And if you do multiply the first number by the fourth, & the second number by the third, the products of your two multiplications will be equall. Likewise if you deuide the one semblant by the other, that is to say, the third number by the first, and likewise the one dissemblant by the other, that is to say, the fourth number by the second (which are dissemblant

to the other two numbers) your two quotients wil also be equall.

The stile and maner of this rule is thus: you must set downe your three numbers in a certaine order, as by example following shall appeare. And then you shall multiply the third number by the second, and the product or nūber ꝑ commeth of the same multiplication, you must devide by the first nūber: or otherwise, devide the first number by the second, and the quotient thereof shall be your divisor unto the third number, that is to say, the third number shall be divided by the quotiēt of the foresaid division, ꝑ is by the quotient of the first number devided by the second. Or otherwise, divide the second number by the first, and that number which commeth into your quotiēt, you shall multiplie by the third number. And thus shall you have the fourth nūber which you seeke for. And thus is your fourth number in such proportion unto the third, as your second number is unto the first.

Example.

If 8 be worth 12, what are 14 worth after the rate? or elſe if 8 require 12, for his proportionall, what wil 14 demaund? The which three nũbers may conueniently be ſet in ſuch order, as hereafter doth appeare.

If 8 make 12, what will 14 make? you muſt multiply the thirde number 14, by the ſeconde which is 12, and thereof commeth 168 for the whole producte of this multiplication: the which (as the rule teacheth) you muſt diuide by the firſt number, that is to ſay by 8, and thereof commeth 21. And ſo muche are the 14 worth. This is the way which is moſt vſed.

	14
	12
8 . 12 . 14 .	28
	14
~~1~~~~6~~~~8~~ | 21 ~~8~~~~8~~	168

Otherwiſe

Otherwise diuide 8 by 12, whiche you can not doe, for they are $\frac{8}{12}$, wherfore abbreuy $\frac{8}{12}$, and they are $\frac{2}{3}$ for youre quotient, thē diuide the thirde nūber 14, by the sayd $\frac{2}{3}$, multiplying 14 by 3, which maketh 42: diuide 42 by 3, and you shall haue 21, as before. Or else diuide the seconde number 12, by the firste number 8, and thereof commeth 1 $\frac{1}{2}$, the whiche 1 $\frac{1}{2}$ you shal multiplye by the thirde number 14, and thereof will come 21, as is abouesayde: and thus must you doe of al other, and although that the numbers of this rule may bee founde in three differences, for sometimes they are whole numbers and broken together, sometimes broken number, & broken together, and sometimes all whole numbers, if they be whole numbers, you muste doe none otherwise, then you did in the laste example: But in case they bee broken numbers, or broken and whole numbers togither, the maner and waye to

2	12
4	6
8	3

doe them, requireth a certaine variation and difficultie, according to the variety of the numbers that shall be proponed: the which operation easily to doe, and unvariable, this rule teacheth.

The three numbers being set downe according unto the order of the whole numbers aforesaid, without any broken number, let 1 be put alwayes underneath every whole number with a line betweene them, fraction wise, as thus $\frac{8}{1}$, and that 1 is denominator to every such whole number. But when you have whole number and broken together, they must be reduced and added with their broken number, and if there be broken number without any whole number, the same broken must remaine in their estate.

The rule of 3 in fractions.

This being doone, you shall multiply the denominator of the first number, by the numerator of the second

and multiply the product therof againe by the numerator of the third number. And so shall you haue the deuidend, or number which must be diuided, then multiply the numerator of the first nũber by the denominator of the second, & multiply againe the product thereof, by the denominator of the third number, and that which commeth of this multiplication shall be your diuisor. Then diuide the number which is to be deuided by the deuisor, and you shall find the fourth number that you seeke, Of the which maner and fashions of ẏ rule of three, are diuers kinds, wherof the first is of 3 whole numbers, as was the last example, and here followeth the second.

If 15 pounds doe buy me 2 clothes, how many clothes will 300 poundes buy me, of the same price that the two clothes did cost: Set downe your three numbers thus.

The Example followeth in the next paage.

Lib. Clothes. Lib.

15. 2. 300. 2

2 ~~6~~~~0~~~~0~~

600 ~~1~~~~5~~ (40

1

And then as you see, you must multiplie the third nūber which is 300 Li. by 2, which is the second number, and thereof commeth 600, the whiche 600 you muste diuide by the firste number 15, and you shall finde in your quotient 40, which is 40 clothes and so many clothes shall you buy, for 309 Li. as appeareth by practise here aboue written. And here you must mark that the first number, and the third in this question be of one denomination, as before I haue declared, & likewise the second and the fourth numbers, which you haue found, are of one semblaunce and likenesse, but in case that the fyrste number and the third in anye question be not of like denomination, you muste in (working) bring them into one denomination or nature, as in this ex-

ample following. If 12 Nobles doe gaine me 6 frenche crownes, how many frenche Crownes will 48 poundes gaine me? Here you see that the denomination of the first number is Nobles and the Denomination of the third is poundes: wherefore, before you doe proceede to worke by the rule of three, you must first turne the pounds into nobles, in multiplying 48 pounds by three Nobles, and they make 144 nobles, for that there is in euery poūd of mony 3 Nobles, or otherwise if you will, you may bring the first number being 12 Nobles, into poundes, by deuiding them by three, and thus shall your first & third numbers be brought into one denomination, then shall you sette downe your 3 numbers in order thus.

If 12 Nobles doe gaine me 6 french Crownes, what shall 144 Nobles gaine: the which 144 are the Nobles which are in 48 li. Then multiply the third number 144, by the second number 6, and therof commeth 864,

the which you must diuide by 12 no-bles, and thereof commeth 72 French Crownes.

And so many French Crownes wil the 144 Nobles gayne me.

Nobles.	Crownes.	Nobles.
12	6	144.

144 ~~12~~0 Nobles.
6 ~~8~~~~6~~4 (72
864 ~~122~~
~~1~~

There is yet a more exacte waye, wherby to worke in this rule of three, which is thus You must marke if the third and first numbers in the rule of three, may be both diuided by one like diuisor, the whiche after you haue diuided them; you shall write downe each of the quotients orderlye, in the sayd rule of 3, euery one of them in his owne place, as though those were all of the numbers of your question, and not chaunging the middle nūber, that is

is to ſay the ſeconde. And thus, if 50 Crownes doe buy mee 44 yeardes of cloth, howe many yardes ſhall I haue for 120 Crownes? Here you maye ſee that the thirde and the firſte numbers, may be diuided by 10, whiche in the third number, is found 12 times, and in the firſt 5 times. Wherfore you ſhal put 12, for the thirde number in the rule of three, in ſteed of 120: & 5 for the firſt number in ſteede of 50, and let 44 remain ſtill in the middeſt, for the ſecond number, after this ſort as followeth, and then worke by the rule as before.

Crownes. Yardes. Crownes.

5. 44. 12.
12.
87
44
528

3
~~528~~ (105 3/5.
~~555~~

You muſt multiplie 44 by 12, and thereof commeth 528: diuide the ſame 528 by 5, and you ſhall finde in your quotient 105 $\frac{3}{5}$, and euen ſo manye

yardes

yardes should you haue found, if you had wrought the rule of three, by the first numbers proposed. There is yet certaine other varieties, in working by the rule of three, but for that they require the knowledge of fractions, & because they are not so easie as this first way, which is common, therfore content your selues with this same, vntil you haue learned the fractiōs, the which by Gods helpe I intend to set forth in the second part of this booke, incontinently after that I haue first taught you the backer rule of three.

Of the backer Rule of three.

The backer rule of three is so called because it requireth a contarie working to that, which the Rule of three direct doth teache, whereof I haue now treated. For in the direct rule of three, the greater the third number is, so much the greater will the fourth be. But here in this backer rule, it is contrariwise, for the greater the third nū-

ber

ber is, so much lesser will the fourth be. Then, wheras in the rule of three direct, the third number is multiplied by the second, & the product therof diuided by the first. Here you must multiply the second number by the first, & diuide the product of the same by the third, and the number which commeth in the quotient, aunswereth to the question. For such practise commeth often times in vse: In such sort that if you should worke the same by the rule of three direct, and not to haue a regarde vnto the proposition of the question, you should then commit an euidente & open errour.

Example.

If 15 shillings worth of Wine will serue for the Ordinarie of 46 men when the Tonne of wine is woorth 12 poundes: for how many men will the same 15 shilligs woorth of wine suffice, when the Tonne of wine is woorth but 8 poundes: It is certaine

tayne, that the lower the price is, that the Tonne of wine doth coste, and so many more persons, will the sayde 15 shillings in wine suffice. Therefore, set downe your numbers thus: if 12 poundes suffice 46 men, for how many men will 8 poundes suffice: you must multiplie 46 by 12, and thereof commeth 552, the which 552, you shall diuide by 8, and thereof commeth 69, and vnto 69 men will the sayd 15 shillings worth in wine suffice, when the Tonne of wine is worth but 8 pounds, as hereafter doth appeare by practise.

Lib.	*Men.*	*Lib.*
12	46	8

$$\begin{array}{r} 46 \\ 12 \\ \hline 92 \\ 46 \\ \hline 552 \end{array} \qquad \begin{array}{c} 7 \\ 552 \\ \hline 88 \end{array} \ (69.$$

2. Likewise, a messenger maketh a iourney in 24 dayes, when the daye is but 12 houres long: in howe many dayes

dayes ſhall he make the ſame iourney, when the day is 16 houres in length? Here you muſt perceiue that the more houres there are in a day, the fewer dayes will the meſſenger bee in going his iourney. Therefore write downe your numbers thus, as here you maye ſee.

Houres. Dayes. Houres.

```
12    24.    16          4
      12                ~~12~~
 ___________            ~~288~~
      48            __________
      24                ~~166~~
 ________  __            ~~1~~  (18.
      288
```

And then multiplie 24 dayes by 12 houres, and thereof commeth 288: diuide the ſame 288, by the thirde number 16, & you ſhall finde 18, the which is 18 dayes, and in ſo many dayes will the meſſenger make his iourney, when the day is 16 houres long.

Likewiſe when the buſhel of wheate doth coſt 3 ſhillinges, the peny loafe of bread weigheth 4 lib.

I

I demaunde what the same pennye lofe shall waye, when the bushell of wheate is worth but 2 s. Here is to be considered, that the better cheape the wheate is, the heauier shall the pennie lofe wey, and therefore write downe your 3 numbers thus.

Shil.	*Lib.*	*Shil.*		
3.	4.	2.		
	3.		$\cancel{12}$	*Lib.*
	12.		$\cancel{2}$	(6.

Then multiplie 4 li. whiche is the seconde number, by the first number 3, and they make 12, the whiche 12 you shal diuide by the thirde number: and thereof cometh 6 li, and so much must the penie loafe of bread wey, when the bushell of wheate is worth but 2 shillinges, as may appeare. And nowe according to my former promise, shall follow the second part of Arithmeticke, which teacheth the working by Fractions.

Here endeth the first part of Arithmeticke.

The seconde parte of Arithmeticke, which treateth of Fractions or broken numbers.

The first Chapter treateth of Fractions or broken numbers, and the difference thereof.

A Fraction or a broken number, is as much as a parte of manie parts of 1, whereof there are two numbers with a line betweene them both, that is to say, the one which is aboue the line is caled the numerator, & the other vnderneth the line is called the denominator, as by example three quarters is called a fraction, which must be set down thus $\frac{3}{4}$ whereof 3 which is the higher number aboue the line is called the numerator, and 4 which is vnder the line, is called the denominator. And it is alwaies conuenient that the numerator bee lesse in number, then the denominator. For if the Numerator and the

denominator bee equall numbers, then shall they present a whole num- ber thus, as $\frac{1}{1}, \frac{2}{2}, \frac{3}{3}$, which are whol numbers, by reason that the num- rators of these, and all such like, ma be deuided by their denominators, an their quotients will alwaies be but 1. But in case that the numerator of an fraction doe exceede his denominato then it is more then one whole, as $\frac{2}{1}$ is more then a whole number by $\frac{1}{}$ And this is commonly called an im proper fraction, other definition do not hereunto appertain. Furthermo it is to be vnderstoode that when th numerator is iust the halfe of the den minator, then the same broken numb is the iust halfe of 1 whole, as $\frac{6}{12}$. $\frac{7}{14}$ $\frac{8}{16}$. $\frac{9}{18}$. and other like, are the halfes o one whole number, whether it be money, of measure, of weight, or any ther thing: whereof doth grow & co foorth 2 progressions natural, the o progreding by augmenting or incr sing, as these.

$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}$. &c.

And they doe procede infinitelie, & will neuer reach to make a whole nūber, thus, $\frac{1}{1}$. And the other progression, doth progredy by diminishine or decreasing, as thus.

$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}$, &c

And these doe procede infinitelie and shal neuer come to make a o which signifieth nothing, but shal euer retaine some certaine vallue of an vnity wherby it doth appeare that fractions or broken numbers are infinite.

The second Chapter treateth of the re*ducing or bringing together of two Fractions or manie of diuers denominations, vnto Fractions of one like denomination.*

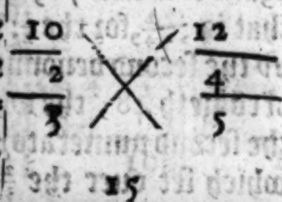
REduction, is as much as to reduce and bring together, or to put 2 or manie numbers, being of diuers denominations the one from the other, into fractions of one denomination,

in reducing them unto a common denominator, and the reason thereof is, For because the diuersitie and difference of the broken numbers doe come of the denominators part, or of diuers denominators, and for the understanding heereof, there is a generall rule whose operation or working is thus: Multiply the denominators of ẏ fractions, the one by the other, and so you shall haue a new denominator common to all the fractions, the which denominator you must diuide by ẏ particular denominators of euery of the said fractions, and multiply euery quotient by his owne numerator, and so you shall haue new numerators, for the numbers which you would reduce, as appeareth by this example following.

Reduction in common denomination.

1. If you will reduce $\frac{2}{3}$ and $\frac{4}{5}$ together, first make a crosse betweene the fractions, as here you see, and then you

you must multiply the two denominators the one by the other, that is to say 3 by 5 maketh 15, which is your commō denominator, set that vnder the crosse then diuide 15 by the denominator 3, and you shal haue 5 which multiply by the numerator 2, and you shall finde 10, set that ouer the $\frac{2}{3}$, and they are $\frac{10}{15}$, for the $\frac{2}{3}$. Afterwardes diuide 15 by the denominator 5: and thereof commeth 3, the whiche multiply by the numerator 4, and you shall finde 12, which set ouer the heade of the $\frac{4}{5}$, and they make $\frac{12}{15}$ for the $\frac{4}{5}$: as appeareth more playner aboue in the margent.

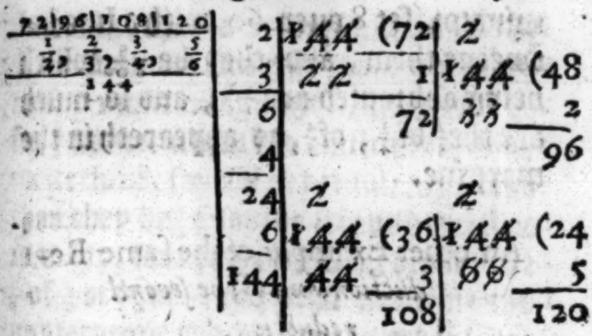


2. If you wil reduce $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, togyther, you must multiplie all the denominators the one by the other, that is to saye, 2 by 3 maketh 6: then 6 by 4 amounteth to 24. Last of all 24 by 6, and thereof commeth 144, for the commō denominator. Thē, for ẏ first fraction

tion which is $\frac{1}{2}$, diuide 144 by the denominator 2, and thereof commeth 72, the which multiply by the numerator 1, and it is still 72, set that ouer the $\frac{1}{2}$ & that is $\frac{72}{144}$, for the $\frac{1}{2}$: Then deuide 144 by the second denominator 3, & thereof cōmeth 48, the which multiply by the second numerator 2, & they are 96 which set ouer the $\frac{2}{3}$, and they make $\frac{96}{144}$, for the $\frac{2}{3}$: Then deuide 144 by the third denominator 4, and thereof commeth 36, the which multiply by the third numerator 3, and they make 108: which set ouer the $\frac{3}{4}$, and they are $\frac{108}{144}$ for the $\frac{3}{4}$.

Finally diuide 144 by the last denominator 6, & thereof commeth 24: The which multiply by the last numerator 5, and thereof commeth 120. Which set ouer the $\frac{5}{6}$, and they are $\frac{120}{144}$, for the $\frac{5}{6}$, as appeareth heare by practise.

The Example followeth in the next paage,



Reduction of broken numbers *of broken.*

3. If you will reduce the broken of broken together, as thus, the $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, you must multiply all the numerators, the one by the other to make one broken number of the three broken nūbers: that is to say, 2 by 1, maketh 2: and then 2 by 4 maketh 8: whiche 8 is your numerator. Then multiply the Denominators the one by the other, that is to say, 3 by 4, maketh 12, and then 12 by 5, maketh 60 for youre denominator.

$$\frac{8}{60} \qquad \frac{2}{3},\ \frac{1}{4},\ \frac{4}{5}$$

minator, set 8 ouer 60, with a line betweene them, and they be $\frac{8}{60}$, which being abbreuied are $\frac{2}{15}$, and so much are the $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, as appeareth in the margine.

An other Example of the same Reduction, and of the second reduction.

If you will reduce $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, the $\frac{3}{4}$ of $\frac{5}{7}$: And the $\frac{1}{2}$ of the $\frac{1}{2}$, of the $\frac{2}{3}$ of $\frac{1}{8}$. First it behoueth you of euery partie of the broken number, to make of eache of them one broken: as by the thirde reduction is taught: that is to say, in multiplying of numerators by numerators, and denominators by denominators: First for the first parte which is $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, you must as is before sayd, multiply 2 by 1, and then by 4, and you shall haue 8 for the numerator, likewise multiply 3 by 4, and the product by 5, and you shall haue 60 for the denominator: so they make $\frac{8}{60}$, which being abbreuied are $\frac{2}{15}$ for the first

first part, that is to say, for the $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$: secōdly for the $\frac{3}{4}$ of $\frac{5}{7}$ multyply likewise ẏ numerator 3 by 5, maketh 15, for ẏ numerator. And multiply 4 by 7 maketh 28, for the denominator. And then they be $\frac{15}{28}$ for the second part: that is to say, for the $\frac{3}{4}$ of $\frac{5}{7}$ Thirdly for the $\frac{1}{2}$ of $\frac{1}{2}$ of $\frac{2}{3}$, of $\frac{1}{3}$, you must multiply the numerators the one by the other that is to say 1 by 1, and then by 2 and last by 1, and all maketh but 2, for the numerator, likewise multiply the denominators 2 by 2, maketh 4, 4 and by 3 maketh 12, and then 12 by 3 maketh 36, for the denominator, and they are $\frac{2}{36}$, which being abbreuied maketh $\frac{1}{18}$, for the third part, that is to say, for $\frac{1}{2}$ of the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{3}$. Last of all take the $\frac{2}{15}$, the $\frac{15}{28}$, and the $\frac{1}{18}$, & reduce them according to the order of the second reduction, and you shall finde $\frac{1008}{7560}$ for the $\frac{2}{15}$. And $\frac{4050}{7560}$ for the $\frac{15}{28}$. And $\frac{420}{7560}$ for the $\frac{1}{18}$: and thus are broken numbers of broken, reduced, as appeareth by practise.

$\frac{2}{3},\ \frac{1}{4},\ \frac{4}{5}$ — 8 — 60 | 2, 1, 2, 4, 8 | 3, 4, 12, 5, 60 | 2, 8, 60, 15 | $\frac{3}{4},\ \frac{5}{7}$ — 15 — 28

$\frac{1}{2},\ \frac{1}{2},\ \frac{2}{3},\ \frac{1}{3}$ — 2 — 36 | 1, 2, 1, 2, 2, 1, 2 | 2, 2, 4, 3, 12, 3, 36 | 1, 2, 16, 18

1008 — 2 — 153 | 4050 — 15 — 201 | 420 — 1 — 18 | 7560

15 2 2
28 | 7560 (504
120 | 1888
30 | 11
420
18
3360
420
7360

2 | 1008

18
390
7560 (270
2888
22

270
15
1350
270
4050

1
330
7560 (420
1888
11

1
420

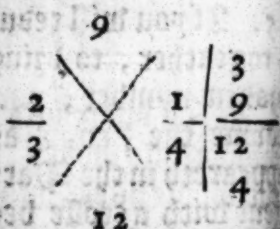
Reduction of broken numbers, and *the parts of the same.*

5. If you will reduce $\frac{1}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$ togeather, to bring them into one broken number, you must first sette downe the $\frac{1}{3}$ and $\frac{1}{2}$ as appeareth in the Margent with a crosse betweene them, and then multiply the two denominators, the one by the other, that is to say, 2 by 3, maketh 6, set that vnder the crosse, then multiply the first numerator 1, by the last denominator 2, and that maketh 2: vnto the which add the last numerator 1, and they be 3 which set aboue your crosse, so you shall finde that the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$ doe make $\frac{3}{6}$, which being abbreuied doth make $\frac{1}{2}$: which is as much as the $\frac{1}{3}$ and the $\frac{1}{2}$ of $\frac{1}{3}$, being reduced into one fraction.

$$\begin{array}{ccc} & 3 & \\ \frac{1}{3} & \times & \frac{1}{2} \\ & 6 & \end{array}$$

Likewise if you will reduce the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$, you must doe as before, set downe the $\frac{2}{3}$ and $\frac{1}{4}$, with a crosse betweene

betweene them, thē multiply the two denominators the one by the other, ẏ is to saye 3 by 4, maketh 12: whiche set vnder the crosse, as you see in the margente: and then multiplye ẏ first numerator 2, by the last denominator 4, and thereof commeth 8, wherevnto adde the laste numerator 1, & that maketh 9, whiche 9 set ouer the crosse, so shall you finde that the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$, are worth $\frac{9}{12}$, the whiche abreuied doe make $\frac{3}{4}$, as appeareth by example in the margent.



(∴)

Reduction of whole numbers and *broken together into a Fraction, the which fraction is called an improper Fraction.*

If you wil reduce whole number & bꝛoken, into bꝛoken, you ſhall reduce the whole nũber into bꝛokẽ, as by this example may appeare: if you will reduce 17$\frac{5}{8}$, into a bꝛoken number, firſte you muſt multiply the whole number 17 by the denominatoꝛ of the bꝛoken, which is 8, in ſaying 8 times 17, doe make 136, vnto the whiche you muſte adde the numeratoꝛ of $\frac{5}{8}$, whiche is 5, and all amounteth to 141, whiche ſet ouer $\frac{5}{8}$, with a line betweene them, and they will bee $\frac{141}{8}$ ſo muche is 17$\frac{5}{8}$, woꝛth in an impꝛoper fraction, as appeareth here by pꝛactiſe.

$$\begin{array}{r} 17 \\ 8 \\ \hline 136 \\ 5 \\ \hline 141 \end{array} \quad \Bigg| \quad \begin{array}{c} 141 \\ \hline 17\frac{5}{8} \end{array} \Bigg| \quad \text{maketh} \frac{141}{8}$$

In

In case you haue whole number and broken, to be reduced with broke͂, you must bring the whole number into his broken: in multiplying it by the denominator of the broken number going therewith, and adde thereunto the numerator of the sayde broken number, as in the last example is declared, and then reduce that broken number with the other broken, as here appeareth by this example. Reduce $10\frac{2}{3}$ and $\frac{4}{7}$ together, first bring $10\frac{2}{3}$ all into thirds as it is taught by the sixte reduction, and you shall finde $\frac{32}{3}$, then reduce the $\frac{32}{3}$ and $\frac{4}{7}$ together, by the first reduction, and you shall finde $\frac{224}{21}$ for the $\frac{32}{3}$: and $\frac{12}{21}$ for $\frac{4}{7}$ as appeareth here by practise.

32	224		12	32	4
$10\frac{2}{3}$	$\frac{32}{3}$		$\frac{4}{7}$	7	3
				224	12
		21			

Also in case you haue in both partes of

of your reduction, as well whole numbers as broken, you must alwaies put the whole of each part into his broken as by the 6 reduction is taught.

Example.

If you will reduce $12\frac{1}{4}$ with $14\frac{2}{3}$, to bring them into one denomination first bring the $12\frac{1}{4}$ all into fourthes, & you shall find $\frac{49}{4}$ then likewise reduce $14\frac{2}{3}$ all into thirds, and you shall haue $\frac{44}{3}$, for the $14\frac{2}{3}$: then reduce $\frac{49}{4}$ and $\frac{44}{3}$ together by the order of the first reduction, and you shall find $\frac{147}{12}$ for the $\frac{49}{4}$. And $\frac{176}{12}$ for $\frac{44}{3}$, as heereby practise doth plainly appeare.

$$\frac{49 \mid 44}{12\frac{1}{4} \quad 14\frac{2}{3}} \qquad \frac{147}{\frac{49}{4}} \qquad \times \qquad \frac{176}{\frac{44}{3}}$$

$$12$$

The thirde Chapter teacheth of *abbreuiation of one broken nū-ber into a lesser broken.*

ABbreuiation is as much as to set downe, or to write a broken number by figures of lesse signification, and not diminishing the vallue therof, ¶ The which to doe, there is a rule, whose operation is thus, deuide the numerator, and likewise the denominator by one whole number, the greatest that you may find in the same broken number, and the quotient of that numerator, make it the numerator, and likewise of that of the denominator, make it your denominator, as by example.

1. If you will abbreuiate $\frac{54}{81}$, you shall vnderstand that yͤ greatest whole number that you may take, by the which you may deuide the numerator, and the denominator is 27, which is the halfe of the denominator, & that is a whole number for you cannot take a whole number out of the denomina-

tor

for 81, which will deuide both the numerator & denominator, but that there will bee eyther more or lesse then a whole number, therefore if you diuide 54 by 27, you shall finde in the quotient 2 for the numerator: likewise if you diuide 81 by 27 you shall haue in the quotient 3 for the denominator, then put 2 ouer the 3, with a line betweene them, and you shall finde $\frac{2}{3}$, and thus by this rule the $\frac{54}{81}$ are abreuied vnto $\frac{2}{3}$, as appeareth in the margine, and so is it to be vnderstoode of all other.

$\frac{54}{81}$

$\cancel{1}\cancel{0}$
$\cancel{5}\cancel{4}$ (2
$\cancel{2}\cancel{7}$

$\frac{2}{3}$

$\cancel{2}\cancel{0}$
$\cancel{8}\cancel{1}$ (3
$\cancel{2}\cancel{7}$

The forme and manner how to find the greatest number by the which you maye wholy diuide the numerator, and denominator, to the end you may abbreuiate them, is thus.

First diuide the denominator by his numerator, and if any number doe remaine, let your deuisor be deuided by the same number, and so you must continue vntill you haue so often times diuided, that there may nothing remaine: then is it to be vnderstoode, that your last deuisor, (whereat you did end and that o did remaine after your deuision) is the greatest number, by the which you must abreuiate, as you did in the last example. But in case that your last deuisor be 1, it is a token that the same number cannot be abbreuied to any lower fractiō then you find it at the first. Example of $\frac{54}{81}$: deuide 81, which is the denominator by 54 which is his numerator, and there resteth 27, then diuide 54 by 27, and there remaineth o, which is nothing, wherefore your last

last deuisor 27 is the number by the which you must abreuiate $\frac{54}{81}$: as in the last example is specified.

¶ Another maner of abbreuiation.

2. Mediate the numerator, and also the Denominator of your Fraction, in case the numbers be euen, that is to say, take alwaies the halfe of the numerator, and likewise of the denominator, and of the mediation or halfe of the numerator, make it youre numerator, also of half that denominator make your denominator, & so continue as often as you may in taking alwayes the half of the numerator, & likewise of the denominator, or else see if you may abbreuiate the numbers which doe remaine, by 3: by 4, by 5, 6, 7, 8, 9: or by 10, for you must abbreuiate them as often as you can by any of the saide numbers. And it is to be noted, that with whatsoeuer number of these, you doe abreuiate the numerator of youre fraction, by the same you must abbreuiate

uiate likewise the denominator, so continuing vntill they canne no more bee abbreuied, and it is to be vnderstoode, that if the numerator, and the denominator, be euen numbers, as you maye know when the firste figure of an euen number, or a 0, then you may perceiue if both the Numerator and the Denominator may be abreuied by 10, by 8 by 4, or by 2: albeit that somtimes they may be abreuied by 3. And if they be odde numbers, then must you consider if they may be abreuied by 9, by 7, by 5, or by 3, but when the first number, as well of the numerator, as of the denominator are euen numbers, then maye you well knowe that suche numbers may be abreuied by 2, as is aforesaid. And if you adde the figures of the numerator together, in such manner as you doe in making the proofe by 2 in whole numbers, that is if you finde 9, it appeareth that you maye abbreuie that number by 9. And likewise by 3, and sometines by 6, if you finde 6 it may be abbreuied by 6, and alwaies

alwayes by 3 if you finde 3, it is signe that you abreuiate by 3. And by what soeuer number that you do abbreuiate the numerator, by the same muste you abreuiate likewise the denominator, and if the first figures of the same number be 5, or 0 you may abreuiate them by 5, but if the first figures be both 0, they may be abreuied 10: in cutting away the 2 ciphers thus, as $\frac{2}{3}\big|\frac{0}{0}$ whiche maketh $\frac{2}{3}$, and sometimes by 100 thus, as $\frac{1}{2}\big|\frac{00}{00}$, in cutting awaye the foure ciphers after this sorte, $\frac{1}{2}\big|\frac{00}{00}$ and then the $\frac{100}{200}$ doe make $\frac{1}{2}$, and after this maner haue I set here diuers examples, although that all broken numbers can not be abreuied by this rule, yet all fractions may be well abreuied by the first rule aforesaid.

abreuied.

$\frac{3840}{7680}$ by 10	$\frac{1890}{4725}$ by 9.
$\frac{384}{768}$ by 8	$\frac{210}{525}$ by 7.
$\frac{40}{96}$ by 6	$\frac{30}{75}$ by 5.
$\frac{8}{16}$ by 4	$\frac{6}{15}$ by 3.
$\frac{2}{4}$ by 2	$\frac{2}{5}$
$\frac{1}{2}$	

3. Furthermore you shall vnderstande that sometimes it happeneth, that all the figures of the numerator are equall vnto them of the denominator, which when it so happeneth, you may then take one of them of the numerator, and also one of them of the denominator, and it shall be abreuied, as $\frac{555}{888}$, being abreuied after this maner, commeth to $\frac{5}{8}$. And yet it happeneth sometimes, that two or many figures of the Numerator are proportioned vnto two, or many figures of their Denominator, and that the other figures of the same number are the

figures

one to the other in this proportion following. Then may you take two or more figures, aſwel of the numerator as of yͤ denominator, & by this maner the ſame number ſhal be abreuied, $\frac{4747}{5959}$ being abreuied by this rule, doe come to $\frac{47}{58}$.

4. Alſo it happeneth ſometimes that you would abreuiate one number unto the ſemblance or likeneſſe of an other. And for to knowe if the ſame may be abbreuied, and alſo by what number it may be abbreuied you muſt diuide the numerator of the one number, by the numerator of the other, and likewiſe the Denominator of the one by the denominator of the other, for in caſe that after euery diuiſion there doe remaine 0, and that the two quotients be equall, then is one of them the number by the which the ſaid fraction muſt be abreuied, as by example of $\frac{115}{207}$. I would know if they may be abreuied unto $\frac{5}{9}$, and for to doe this, you muſt diuide a 115 by 5, and you muſt diuide 207 by 9, and there will

come into both the quotients 23 by the which it appeareth that this number may be abbreuied by 23.

	1Ø		
$\frac{115}{207}$	115		2Ø
$\frac{5}{9}$	88	(23	207
			99 (23

The .4. Chapter treateth of the Adding of two or manie broken numbers together, as by example.

FOR to adde Fractions or broken numbers together, there is a generall rule, which is thus, if the numbers be of vnlike denominations the one to the other, you must reduce them into a common denomination by the doctrine of the first reduction, & when you haue reduced them, you must then adde both the numerators together, and set the product of the said addition ouer the crosse and deuide the same Numerator by the common denominator

nator

nator, as by the example following.

1. If you will adde $\frac{2}{3}$ with $\frac{3}{4}$, you must first reduce the two Fractions both into one denomination according to the order of the first reduction, that is to saie in multiplying the denominator of the first fraction which is 3, by the denominator of the other fraction which is 4, and they make 12 for your common denominator: the which 12 you shal set vnder yͤ crosse, then multiply the first numertor 2 by the last denominator 4, & therof cōmeth 8 which set ouer the $\frac{2}{3}$, and then multiply the last numerator 3, by the first denominator 3, and thereof commeth 9, which you must set ouer the $\frac{3}{4}$, then adde the numerator 8 with the numerator 9, and they make 17, which set ouer the crosse, and then your

5
$\cancel{17}$
$\cancel{12}$ (1 $\frac{5}{12}$

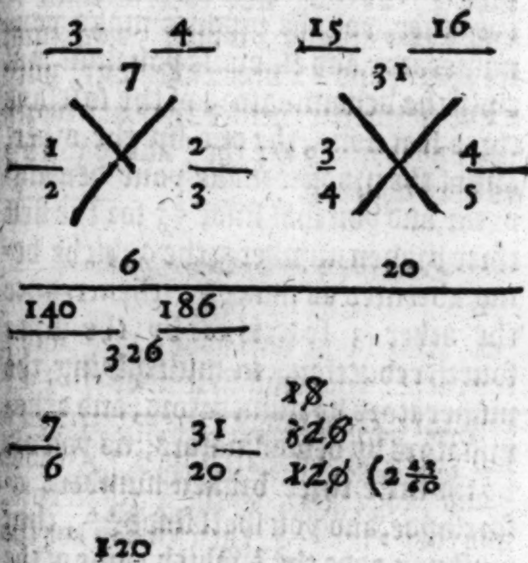
fraction

fraction will be $\frac{17}{12}$: which is the addition of $\frac{2}{3}$ with $\frac{3}{4}$. And because the numerator 17 is greater then his denominator 12, therefore you must diuide 17 by 12, and thereof come 1, and 5 remayning, which 5 you must set apart, and 12 vnder the same, with a line betweene them, & they are worth $\frac{5}{12}$, and so much are the $\frac{2}{3}$ added with $\frac{3}{4}$ as doth appeare.

Addition in broken numbers.

2. Also if you will adde $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{4}{5}$ togeather you must first adde the $\frac{1}{2}$ & $\frac{2}{3}$ together, accor ding to the doctrine of y last rule, and you shall find $\frac{7}{6}$: then adde $\frac{3}{4}$ and $\frac{4}{5}$ together, by the said last rule, and they make $\frac{31}{20}$, then finally add the $\frac{7}{6}$ (which came of the $\frac{1}{2}$ and $\frac{2}{3}$ added together with $\frac{31}{20}$, which came of the $\frac{3}{4}$ and $\frac{4}{5}$ added togeather, and you shall finde by the foresaide Addition, that they amounte vnto $\frac{326}{120}$. Wherefore diuide 326 by 120, and thereof commeth 2, & 86 remaineth which is $\frac{86}{120}$ of one

one whole, and they being abreuied do make $\frac{43}{60}$, and thus the $\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{4}$, and $\frac{4}{5}$ being added together, doe amount to 2 & $\frac{43}{60}$, as hereunder doth appeare.



Addition of broken number of broken.

3. Furthermore, if you wil adde the broken numbers of broken together as

as to adde the $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$, with ẏ $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$: first you must reduce the numbers according to the order of the fourth reduction, in multiplying the numerators of the first 3 fractions, the one by the other, & of the product make your numerator, and likewise you must multiply the denominators of the foresayd three fractions, the one by the other, and of the product make your denominator, and you shal finde $\frac{24}{60}$ for the first three broken numbers, the whiche being abreuied do make $\frac{2}{5}$, then reduce the other 3 fractions by the sayde fourth reduction, in multiplying the numerators by numerators, and denominators by denominators, as you did by the firste three broken numbers aforesayde, and you shall finde $\frac{25}{96}$, then must you adde the $\frac{2}{5}$ which came of the first 3 broken numbers, and $\frac{25}{96}$ whiche are come of the laste 3 fractions, both togither by the instruction of the first addition: & you shal finde $\frac{317}{480}$: whiche cannot be abreuied, but is the iuste product of the addition: so much are $\frac{2}{3}$ of

of $\frac{3}{4}$ of $\frac{4}{5}$ added with the $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$, as hereafter by practise doth euidentlye appeare.

24 25

$\frac{2}{3}$, $\frac{3}{4}$. $\frac{4}{5}$, $\frac{5}{6}$, $\frac{1}{2}$, $\frac{5}{8}$

60 $\frac{2}{5}$ 96

317

192 125

$\frac{2}{5}$ $\frac{25}{96}$ $\frac{317}{480}$

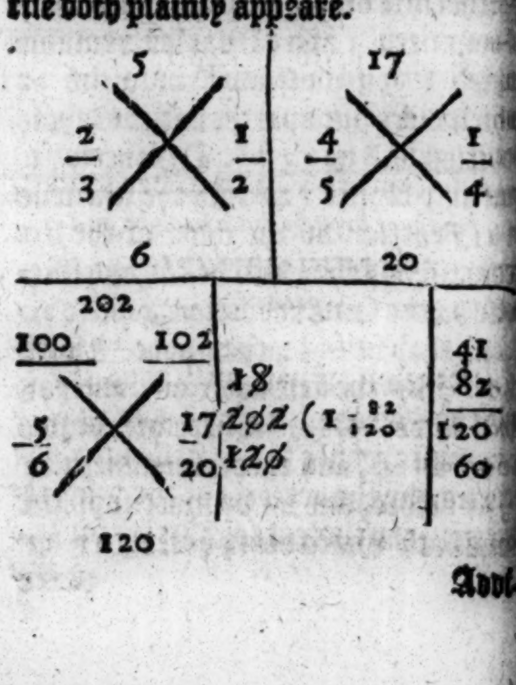
480

Addition of broken number, and *partes of broken, with broken, and the partes of broken together.*

4. Likewise if you will adde the $\frac{2}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$ with the $\frac{4}{5}$ and $\frac{1}{4}$ of $\frac{1}{4}$ you muste reduce the $\frac{2}{3}$ $\frac{1}{2}$ firste into one fraction by the doctrine of the lyke reduction, and thereof commeth $\frac{5}{6}$ for the

$\frac{2}{3}$ and

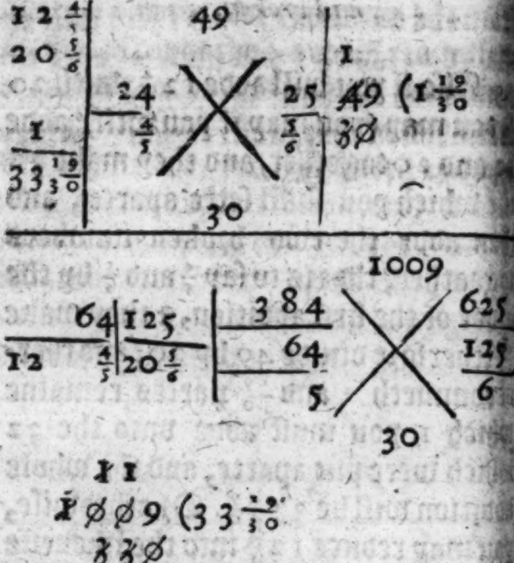
$\frac{2}{3}$ and $\frac{1}{2}$ of one of the sayd thirdes: then reduce the $\frac{4}{5}$ and $\frac{1}{4}$ by the sayd fifte reduction and thereof commeth $\frac{17}{20}$.
Last of all adde the $\frac{5}{6}$ and $\frac{17}{20}$ together according to the first rule of addition: & you shal find $\frac{202}{120}$, which being diuided bringeth 1, and $\frac{82}{120}$ parte remayning, which abreuied maketh $\frac{41}{60}$: and thus you doe perceiue that the $\frac{2}{3}$ and $\frac{1}{2}$ of $\frac{1}{3}$, added with the $\frac{4}{5}$ and $\frac{1}{4}$ of $\frac{1}{5}$, do amount vnto 1 $\frac{41}{60}$, as hereafter by practise doth plainly appeare.



Addition of whole number and broken, *with whole number and broken.*

5 Also if you will adde 12 $\frac{4}{5}$ with 20 $\frac{5}{6}$, you may (you may if you will) adde 12 and 20 together, and they make 32 the which you shall sette aparte, and then adde the two broken numbers togeather, that is to say $\frac{4}{5}$ and $\frac{5}{6}$ by the order of the first addition, & they make $\frac{49}{30}$: therfore diuide 49 by 30, and thereof commeth 1 and $\frac{19}{30}$ partes remaine which 1 you must adde unto the 32 which were put aparte, and the whole addition will be 33 $\frac{19}{30}$. Or otherwise, you may reduce 12 $\frac{4}{5}$ into the likenesse of a Fraction by the order of the first reductiõ, and they will be $\frac{64}{5}$, and likewise bã the same reduction, reduce 20 $\frac{5}{6}$, and they be $\frac{125}{6}$, then adde $\frac{64}{5}$ with the $\frac{125}{6}$ by the first addition, and you shall finde $\frac{1009}{30}$. Therefore diuide 1009 by 30, and thereof commeth 33 $\frac{19}{30}$ as before, and as by practise of the same both waies doeth heereafter appeare

peare.



The fift Chapter treateth of Subſtracti-on in broken numbers.

1 **If you will ſubtract $\frac{2}{3}$ frõ $\frac{3}{4}$ y[ou] muſt firſt reduce both the fract[i]ons into a common denomination, [by] the doctrine of the firſt reduction, [and]**

you ſhall finde $\frac{8}{12}$ for the $\frac{2}{3}$, and $\frac{9}{12}$ for the $\frac{3}{4}$. Therfore abate the numerator 8 from the numerator 9, & there will remaine 1, which 1 you muſt ſet ouer the croſſe, and the ſame is $\frac{1}{12}$, and ſo much is the reſt of that ſubſtraction, as may appeare heere by practiſe.

2. But if you haue a broken number to be ſubſtracted frō a whole number, you muſt borrowe 1 vnitie of the whole number and reſolue it into a fraction of like denomination, as is that fraction, which you would abate from the ſame whole number, and then abate the ſaide fraction therfrom, and you ſhall finde what doth remaine, as by this example. If you abate $\frac{4}{5}$ from

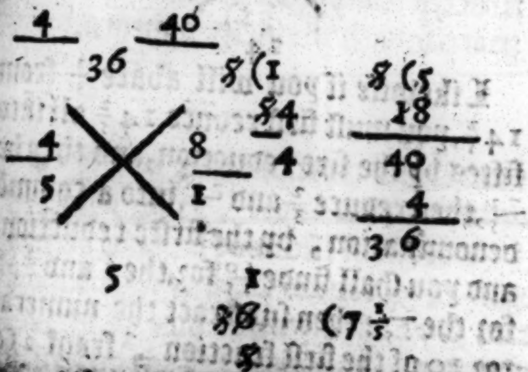
8, you muſt borrow one of the ſaide 8, & reſolue it into fiftes like unto ẏ fraction, becauſe it is $\frac{4}{5}$, and that 1 will be 5 fiftes thus $\frac{5}{5}$, therefore abate $\frac{4}{5}$ from $\frac{5}{5}$, and there will remaine $\frac{1}{5}$, and ſubſtract the 1 which you borrowed from 8, and there doth remaine 7, and the $\frac{1}{5}$ alſo which remained after the ſaide $\frac{4}{5}$ were abated. Thus the $\frac{4}{5}$ being ſubſtracted from 8, doth leaue $7\frac{1}{5}$, as by practiſe doth plainely appeare.

8
1
$7\frac{1}{5}$

Or otherwiſe you ſhall put 1 under 8 with a line betweene and that will be $\frac{8}{1}$: then ſet downe the $\frac{4}{5}$ and the $\frac{8}{1}$ with a croſſe betweene them, then you muſt reduce them into one denomination by the firſt reduction; and you ſhall finde 4 ouer the $\frac{4}{5}$, and 40 ouer the

the

then subtract the saide 4 from 40, and there will remaine 36, the which you shall sette ouer the crosse, and they doe make $\frac{36}{5}$. Likewise you muste multiply the denominator 5 by 1, maketh 5, set that vnder the crosse, then diuide 36 by 5, and thereof will come $7\frac{1}{5}$ as before, for the rest of that subtraction as here by practise appeareth.



3. If you will subtract broken number from whole number and broken: as if you would subtract $\frac{1}{4}$ from $6\frac{5}{6}$, you may by the first subtraction, abate $\frac{1}{4}$ from $\frac{5}{6}$, and there will remaine $\frac{7}{12}$, & the 6 doth stil remaine whole, because the $\frac{1}{4}$ may well be abated from the $\frac{5}{6}$,

and thus $\frac{3}{4}$ being abated from 6 and $\frac{5}{6}$ leaueth $6\frac{1}{12}$ as appeareth by practise.

Likewise if you will abate $\frac{2}{3}$ from $14\frac{2}{5}$, you must first reduce $14\frac{2}{5}$ all into fiftes by the sixt reduction, and they be $\frac{72}{5}$, then reduce $\frac{2}{3}$ and $\frac{72}{5}$ into a commō denomination, by the firste reduction, and you shall finde $\frac{10}{15}$ for the $\frac{2}{3}$ and $\frac{216}{15}$ for the $\frac{72}{5}$: then subtract the numerator 10 of the first fraction, from 216 of the second fraction, and there remayneth $\frac{206}{15}$. Therefore diuide 206, by 15, and thereof commeth $13\frac{11}{15}$ and so much remaynes of this subtraction as may appeare in the next page following.

10 216
72 206
$14\frac{2}{5}$
$\frac{2}{3}$ $\frac{72}{5}$
15
1
~~2~~1
~~28~~
~~200~~
~~188~~
~~1~~
(13 $\frac{2}{3}$ $\frac{11}{15}$

4 If you will ſubſtract whole number and broken, from whole and broken, as thus, if you will ſubſtracte 9 $\frac{1}{4}$, from 20 $\frac{1}{2}$, you muſt reduce 9 $\frac{1}{4}$, into fourthes, and likewiſe the 20 $\frac{1}{2}$ into halfes by the firſt reduction, and you ſhall finde $\frac{37}{4}$ for the 9 $\frac{1}{4}$: and $\frac{41}{2}$ for the 20 $\frac{1}{2}$. Then reduce $\frac{37}{4}$, and $\frac{41}{2}$ into one Denomination: according unto the firſt reduction, and you ſhall finde $\frac{74}{8}$ for the $\frac{37}{4}$, and $\frac{164}{8}$ for the $\frac{41}{2}$, then abate the numerator of $\frac{74}{8}$

which is 74, from 164 whiche is the numerator of $\frac{164}{8}$, & there remayneth $\frac{90}{8}$, then diuide 90 by 8, and therof commeth 11 $\frac{1}{4}$ which is the remayn of this subtraction.

$\frac{1}{2}$ 1

37 | 41

9 | $\frac{1}{4}$ | 20 $\frac{1}{2}$

74 — 164

90

37 — 41

4 — 2

8

164 — 12

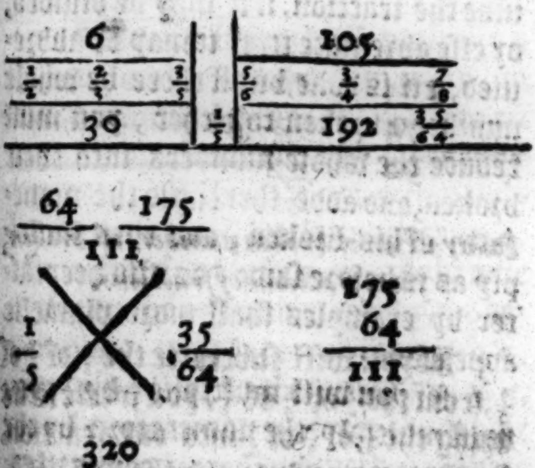
74 — 90 (11 $\frac{1}{4}$

90 — 88

Subtraction of broken numbers of broken, from fractions of fractions.

5 If you will subtracte the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{5}$, from the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$, you muste firste bring the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{5}$ into one fraction, by the 3 reduction: and the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$, likewise into one fraction, by the same reduction, and you shall fynde $\frac{6}{30}$ for the

the first 3 broken numbers, whiche being abreuied do make $\frac{1}{5}$: and for the other three broken numbers, you shall finde $\frac{105}{192}$: whiche being likewyse abreuied do make $\frac{35}{64}$, then you shall substract $\frac{1}{5}$ from $\frac{35}{64}$ by the instruction of the first substraction in reducing both the fractions into a common denomination, as before is done, and you shall finde remaining $\frac{111}{320}$ as maye appeare by example.



The sixt Chapter is of multiplication in *broken numbers.*

FIrst for to multiply in broken number there is a rule which is thus, you must multiply the numerator of the one fraction, by the numerator of the other, and likewise you must multiply the denominator of ẏ one by the denominator of the other. And then diuide the fraction, if it may be diuided, or else abreuiate it, if it may be abbreuied, & it is done, but if there be whole number & broken together, you must reduce the whole numbers into their broken, and adde thereunto the numerator of his broken, and then multiply as is before saide, as also heereafter by examples shall more plainelie appeare.

1 If you will multiplie $\frac{2}{3}$ by $\frac{3}{4}$, you must multiply the numerator 2 by the numerator 3, and thereof commeth 6: for the numerator. Likewise you must multiply the denominators the one

by

by the other, that is to say 3 by 4, and thereof commeth 12 for the denominator: so that this multiplication commeth to $\frac{6}{12}$, which being abbreuied doe make $\frac{1}{2}$: and so much amounteth the multiplication of the $\frac{2}{3}$ by $\frac{3}{4}$, as by practise appeareth.

	6		1
$\frac{2}{3}$		$\frac{3}{4}$	$\frac{6}{12}$
	12		2

2 Likewise if you will multiply a broken number by whole number, or whole number by broken, which is all one, as $\frac{4}{5}$ by 18, or else 18 by $\frac{4}{5}$, you must set 1 vnder 18, thus $\frac{18}{1}$: & then multiply the numirator 18 by the numerator 4, and thereof commeth 72. Likewise mulciply the denominator 5 by the denominator 1, and thereof commeth 5, then diuide 72 by the denominator 5, and therof cōmeth 14 $\frac{2}{5}$, for the whole multiplication. Or otherwise, abate frō 18 his $\frac{1}{5}$ part, which is 3 $\frac{3}{5}$, & there remaineth 14 $\frac{2}{5}$, as hereafter followeth

72		2
$\frac{2}{5}$	$\frac{18}{1}$	72 (14 $\frac{2}{5}$
5		55

Or otherwise.

18		3	18
$\frac{18}{1}$	$\frac{1}{5}$	18 (3 $\frac{3}{5}$	3 $\frac{3}{5}$
5		5	14 $\frac{2}{5}$

3. Also if you will multiply a whole number, by whole number and broken or else whole number and broken, by a whole number whiche is all one, as by example: if you will multiply 15 by 16 $\frac{3}{4}$, or else 16 $\frac{3}{4}$ by 15: Firste reduce 16 $\frac{3}{4}$ al into fourthes, in multiplying 16 by the denominator of $\frac{3}{4}$, which is 4 and thereof commeth 64, whereunto adde the numerator 3, and it maketh $\frac{67}{4}$: which multiply by $\frac{15}{1}$, according to the instruction of the laste example, and you shall finde the product of this multiplication to be 251 $\frac{1}{4}$, as by practise in the next paage following doeth appeare.

$$\frac{67}{16\frac{3}{4}}\ \Big|\ \frac{1005}{\frac{67}{}\quad\frac{15}{}}\ \Big/\ 4 \qquad \begin{array}{r} 67 \\ 15 \\ \hline 335 \\ 67 \\ \hline 1005 \end{array} \qquad \begin{array}{l} \ \ 2\ 1 \\ 1\cancel{0}\cancel{0}\cancel{5}\ (251\frac{1}{4} \\ \ \ 444 \end{array}$$

4 And if you wil multiply a broken number, by whole number and broken or else whole number and broken by a broken. As by example, if you will multiply $\frac{1}{4}$ by 18 $\frac{2}{3}$, or else 18 $\frac{2}{3}$ by $\frac{1}{4}$, which is all one, you must reduce the whole number into his broken by the first reduction, and you shall finde $\frac{56}{3}$, which you shall multiply by the $\frac{1}{4}$ after the doctrine of the first multiplication, that is to saye, in multiplying the Numerator 56, by the Numerator of $\frac{1}{4}$, which is 1: and it is still 56, because 1 doeth neyther multiply nor divide, and likewise you must multiply the denominator 3, by the denominator 4, & it maketh 12: thē divide 56 by 12, and therof cōmeth 4 $\frac{2}{3}$. And so much amounteth ẏ multiplicatiō of the said 18 $\frac{2}{3}$ mul-

$\frac{2}{3}$ multiplyed by $\frac{1}{4}$, as by example.

$$\begin{array}{lcccc} & 56 & 56 & 18 & \\ 18 & \frac{2}{3}\ \frac{56}{1} & \frac{1}{4} & 56 & (4\frac{2}{3} \\ & & 12 & 12 & \end{array}$$

5. If you will multiply whole number and broken, with whole and broken, you muste firste put eyther whole number into his broken, according to the instruction of the sixte reduction, and then multiply the one numerator by the other, and of the product make your numerator. And likewise multiply the denominators the one by the other, and therof make the denominator, then divide the numerator by the denominator, and the quotient shall be the increase of this multiplication. Example. If you would multiply 12 $\frac{4}{5}$ by 6 $\frac{3}{4}$: first by the sixt reduction the 12 $\frac{4}{5}$ will make $\frac{64}{5}$: and the 6 $\frac{3}{4}$ will make $\frac{27}{4}$, then multiply ye numerator 64 by the numerator 27, and therof commeth 1728 for ye numerator. And then you must multiply the denominators

nato

nator 5, by the denominator 4, & they do make 20: then diuide 1728 by 20, and thereof commeth 86, for the whole multiplication as by example.

1728	64	1	
64 27	27	1728	
12 $\frac{4}{5}$ 6$\frac{1}{4}$	448	200	(86$\frac{2}{5}$
	128	2	
20	1728		

6. If you wil multiplye one broken number, by manye broken numbers, thus: as to multiply $\frac{2}{3}$ by $\frac{5}{7}$, and by $\frac{4}{9}$, you muſt multiplie the numerators of all the fractions, the one by the other, and of the product make the numerator: that is to ſay 2 by 5, and they bee 10, then 10 by 4, and they bee 40 for the Numerator. Likewiſe you muſt multiply the denominators the one by the other, that is to ſay, 3 by 7 maketh 21, then 21 by 9 maketh 189 for the denominator: then ſet 40 ouer the 189 with a line betweene them, and they make $\frac{40}{189}$. And ſo muche amounteth

the

the whole multiplication of the $\frac{2}{3}$ mul-
tiplied by $\frac{5}{7}$ and $\frac{4}{9}$, as by example fol-
lowing. And thus is to be vnderstan
of all such like.

	2	3
	5	7
40	10	21
$\frac{2}{3}$ $\frac{5}{7}$ $\frac{4}{9}$	4	9
189	40	189

$\frac{40}{189}$

The 7. Chapter of Diuision in broken numbers.

NOte that in Diuision of broken numbers, you mus sette your deuisor down first, next vnto the left hande, and the diuidende or number which is to bee diuided alwayes to- warde the right hande. And then mul- tiplie crossewise, that is to say, the nu- merator of your diuisor, by the deno- minator of the diuidende: and the pro- duct shall be the denominator, which afterwarde shall bee your Diuis

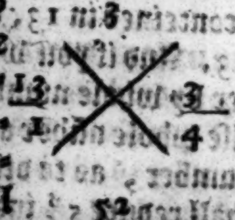
And

And likewise you must multiply the Denominator of your first number, that is to say of your Deuisor, by the Numerator of the Deuidend, which afterward shall be the Diuidend, and that must be set ouer the Crosse, and the denominator vnder the crosse, then diuide the numerator by the denominator if it may be diuided, if not, you must abreuiate them, as hereafter by examples shall more plainly appeare.

1. If you will diuide $\frac{3}{4}$ by $\frac{2}{3}$ you must set the diuisor (which is $\frac{2}{3}$) nexte to the left hande, and the diuidende $\frac{3}{4}$ toward your right hande, with a crosse betweene them: as may appeare by this example in ẏ margent. Then you shall multiplie the numerator of the $\frac{2}{3}$, which is 2 by the denominator of the $\frac{3}{4}$ whiche is 4, and therof cōmeth 8 which shall be your new diuisor: set that 8 vnder the Crosse, as the denominator: then multiply the numerator

meratoꝛ of the deuidend, that is to say of the $\frac{3}{4}$ which is 3 by the denominatoꝛ of the deuisoꝛ, that is to wit, of the $\frac{2}{3}$ which is 3, and thereof commeth 9, set the 9 ouer the crosse of the numeratoꝛ: which shall be now the diuidend oꝛ number to be diuided. Then finallye you shall diuide 9 by 8: and thereof commeth into the quotient 1 $\frac{1}{8}$, and so oftentimes is $\frac{2}{3}$ conteined in $\frac{3}{4}$, as doth appeare befoꝛe in the margent. But in case you would diuide $\frac{2}{3}$ by $\frac{3}{4}$, you must likewise set your diuisoꝛ $\frac{3}{4}$ next to your left hand, as is befoꝛesaid. And then proceede as is aboue declared, and you shall find that $\frac{2}{3}$ diuided by $\frac{3}{4}$ bꝛingeth into the quotient $\frac{8}{9}$ whiche can not be diuided noꝛ abbꝛeuied, wherefoꝛe it appeareth that $\frac{2}{3}$ beeing diuided by $\frac{3}{4}$, bꝛingeth but $\frac{8}{9}$ of one vnitie into the quotient, as doth appeare.

2. Likewise if you will diuide a broken number by a whole number, or else a whole number by a broken, as to diuide $\frac{3}{4}$ by 13, you shall put 1 vnder 3, and it will be $\frac{13}{1}$ for your diuisor, set ye towarde youre lefte hande, and then multiplye 13 by 4, according to the firste diuision, and thereof will come 52, for the denominator, set that vnder the crosse, and multiply 3 by 1, maketh 3 for the numerator, sette that ouer the crosse, and it is $\frac{3}{52}$, as appeareth in the margine.



But if you will diuide 13 by $\frac{3}{4}$, then set the $\frac{3}{4}$ next your left hande, and put one vnder 13, as in the last example, & it is $\frac{13}{1}$, set ye toward youre righte hande thus, as appeareth in the margine, and then worke according to the doctrine of the first diuision, &

L you

you shall finde that 13 being diuyded by $\frac{3}{4}$ bringeth into the quotient $\frac{52}{3}$, then diuyde 52 by 3, and thereof commeth 17 $\frac{1}{3}$, and so oftentimes is $\frac{3}{4}$ conteined in 13, as doth appeare.

21
52
33 (17 $\frac{1}{3}$

3. And if you will diuide whole nūber by whole number and broken, or else whole nūber and broken by whole number, as to diuide 20 by 5 $\frac{5}{6}$, you shall reduce 5 $\frac{5}{6}$ into broken by the sixte reduction, and it maketh $\frac{35}{6}$ for your diuisor, then put 1 vnder 20, and it wil be $\frac{20}{1}$, then shal you multiplye 35 by 1, and 20 by 6, as is taught in the other diuisions, and you shal finde $\frac{120}{35}$: then diuide 120 by 35: and you shall finde in your quotiente 3 and $\frac{15}{35}$, ỹ whiche $\frac{15}{35}$ beeing abbreuied, is $\frac{3}{7}$, and so manye tymes 5 $\frac{5}{6}$ contey-

120

$\frac{35}{6}$ $\frac{20}{1}$

35

1
35
120 (3 $\frac{5}{7}$
33

ned

ned in 20, as in the margine appeareth.

But if you will diuide $5\frac{5}{6}$ by 20, you shall haue $\frac{35}{120}$, then you must diuide 35 by 120, which you cannot dyuide, wherefore you shall abbreuiate $\frac{35}{120}$, and thereof commeth $\frac{7}{24}$ for youre quotient.

4. If you will diuide a broken number, by whole number and broken, or else whole number and broken, by a broken number. As to diuide $\frac{3}{4}$ by $13\frac{2}{3}$, you must reduce $13\frac{2}{3}$, into his broken by the sixt reduction and they bee $\frac{41}{3}$ for your diuisor, then multiply 41 by 4, & they make 164 for your denominator, likewise multiply 3 by 3 and they make 9 for the numerator, & then will your summe bee $\frac{9}{164}$ as appeareth in the worke afore noted.

But if you will diuide $13\frac{2}{3}$ by $\frac{3}{4}$, then you must diuide 164 by 9, and you shall

finde $18\frac{2}{9}$.

5. If you will diuide whole number and broken, by whole number and broken, as to diuide $7\frac{3}{4}$ by $13\frac{2}{3}$, you muſt reduce to whole numbers into their broken, by the doctrine of the ſixt reduction, and you ſhall finde $\frac{31}{4}$, for the $7\frac{3}{4}$, and $\frac{41}{3}$ for the $13\frac{2}{3}$: Then ſet downe $\frac{41}{3}$ toward ŷ left hande, becauſe it is youre diuiſor, and the $\frac{31}{4}$ toward the righte hande, & multiply 41 by 4 for youre denominator: and thereof commeth 164. Likewiſe multiplie 31 by 3, for your Numerator, & it amounteth to 93, the whiche deuiſyon will be thus $\frac{93}{164}$, as before doeth appeare.

93

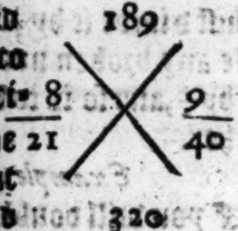
$\frac{41}{3}$ $\frac{31}{4}$

164

But if you will diuide $13\frac{2}{3}$ by $7\frac{3}{4}$, you muſt (contrariwyſe to the other example) diuide 164 by 93: and you ſhall finde in the quotient $1\frac{71}{93}$.

6. The broken numbers of broken, muſt

must be diuided in such maner as broken numbers are, and there is no difference, sauing only that of diuerse and many broken numbers, you must make but two broken numbers, that is to say the one for the diuisor, and the other for the diuidende or number that is to bee diuided, example. If you will diuide the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$, by the $\frac{2}{3}$ of $\frac{4}{7}$, you muste understande that for the fyrst, the $\frac{3}{4}$ of $\frac{3}{5}$ of $\frac{1}{2}$ are $\frac{9}{40}$ by the thirde reduction and the $\frac{2}{3}$ of $\frac{4}{7}$ are by the same reduction $\frac{8}{21}$ thē haue you $\frac{8}{21}$ for your diuisor, and $\frac{9}{40}$ for your number to be diuided, then multiplye 8 by 40, whiche maketh 320, sette that under the crosse and multiplie 9 by 21, and thereof commeth 189: whiche sette ouer the crosse for the numerator, and they make $\frac{189}{320}$ for this diuision as doth appeare.



But if you woulde diuide $\frac{21}{0}$ by $\frac{2}{45}$ you must worke contrarye to the laste

example, that is to say, you must diuide 320, by 189, and therof commeth in ẏ quotient $1\frac{131}{189}$.

The eyght Chapter treateth of Duplation, tryplation, and quadruplation of al broken numbers.

If you wil double any broken nūber you shall diuide ẏ same by $\frac{1}{2}$ likewise if you will triple any fractiō, you must diuide it by $\frac{1}{3}$. And for to quadruple any broken number, you shal diuide it by $\frac{1}{4}$, and so is to be vnderstand of all other.

Example of duplation.

If you will double $\frac{3}{8}$ you shall diuide $\frac{3}{8}$ by $\frac{1}{2}$, and thereof commeth $\frac{6}{8}$, whiche beeing abbreuied are $\frac{3}{4}$ as by example.

Or otherwise, in case the denominator of any fraction be an

euen

euen number, you may tak halfe the saide denominator, without any other operation, and the numerator to abide still the numerator unto the saide halfe of the denominator of the Fraction, as by the other example before rehearsed, that is to say of $\frac{3}{8}$, take $\frac{1}{2}$ of 8 which is 4, and that is the denominator, and 3 remaineth still numerator to 4: and it maketh $\frac{3}{4}$, and so of all other. But in case the denominator be an odde number, that is to say, not euen, then you may multiply the numerator by 2, or else double the numerator, which is all one thing, and the fraction shall bee doubled. Example, if you will double $\frac{3}{5}$ you must onely multiply the numerator 3, by 2, and they be 6: which maketh the fraction to be $\frac{6}{5}$, the whiche 6 being diuided by 5 bringeth $1\frac{1}{5}$ and so much is the double of $\frac{3}{5}$.

Example of triplation.

If you will triple $\frac{3}{5}$ you must diuide $\frac{3}{5}$ by $\frac{1}{3}$, and thereof commeth $\frac{9}{5}$, whiche

 being

beeing deuided, bringeth 1 $\frac{4}{5}$, or otherwise, because the denominator is an odde number, you may multiply the numerator 3 by 3, and therof commeth 9, which maketh $\frac{9}{5}$, as before apeared.

Examples of quadruplation.

If you will quadruple $\frac{4}{5}$, you shall diuide $\frac{4}{5}$ by $\frac{1}{4}$ and thereof commeth $\frac{16}{5}$ which 16 being diuided by 5, bringeth 3 $\frac{1}{5}$, or otherwise, because the denominator of the fraction is an odde number, you shall multiply the numerator of the $\frac{4}{5}$, that is to say, 4 by 4, and thereof commeth 16: the which diuide by 5, and you shall finde 4 $\frac{1}{5}$ as before. And this sufficeth for duplation, triplation, and quadruplation.

The 9 Chapter treateth of the prooues *of broken numbers. And first of reduction.*

If you doe abbreuiate the broken numbers which be reduced, you shall

returne

returne them into the first estate: as by example, if you reduce $\frac{2}{3}$ with $\frac{4}{5}$ you shall finde $\frac{10}{15}$ and $\frac{12}{15}$, then abbreuiate $\frac{10}{15}$, and you shall find $\frac{2}{3}$, abreuiate likewise $\frac{12}{15}$, and thereof commeth $\frac{4}{5}$ as before.

The proofe of Abreuiation.

If you doe multiply that number which you haue abbreuied, by that or those numbers by the whiche you haue abreuied them, you shall returne them againe into their first estate Example, if you will abreuiate $\frac{32}{48}$ by 16, in taking the $\frac{1}{16}$ parte bothe of the numerator, and also of the denominator, you shall finde $\frac{2}{3}$, the proofe is thus, you must multiply both the numerator & denominator of $\frac{2}{3}$, that is to say, 3 by 16, maketh 48 for the denominator, and 2 by 16, maketh 32 for the numerator: then set the numerator 32, ouer the the denominator 48, and they be $\frac{32}{48}$ as before.

The proofe of Addition.

If you doe subtract one of the num-bers, or many of them (whiche you haue added) from the totall summe, there shall remaine ẏ other, or others. Example: if you doe adde $\frac{1}{3}$ with $\frac{1}{4}$, you shall finde $\frac{7}{12}$. The proofe is, if you subtract $\frac{1}{3}$ from $\frac{7}{12}$, you shall finde re-mayning the other number, which is $\frac{1}{4}$, or else if you doe subtract $\frac{1}{4}$ from $\frac{7}{12}$ there will remaine the other number, which is $\frac{1}{3}$.

The proofe of Subtraction.

If you doe adde that number which remaineth, with the number which you did subtract, you shall finde the totall summe, out of the whiche you made the abatement: or otherwise, if you adde the two lesser numbers to-gether, you shall finde the greater. Example: if you doe subtract $\frac{1}{4}$ from $\frac{1}{3}$, there will remaine $\frac{1}{12}$. The proofe is thus: you must adde $\frac{1}{12}$ and $\frac{1}{4}$ together, and you shall finde $\frac{16}{48}$, the which being abbreuiated, doth make $\frac{1}{3}$, which is

is the greatest number.

The proofe of Multiplication.

If you diuide the product of the whole multiplication, by the multiplicator, you shall finde in your quotient the multiplicand or number the which you haue multiplied: or else if you diuide the totall summe which is come of the multiplication, by the multiplicand: you shall finde in the quotient the multiplicator. Exāple, if you multiply $\frac{2}{3}$ by $\frac{4}{5}$, the product of this multiplication will be $\frac{8}{15}$. The proofe is thus: you shall diuide $\frac{8}{15}$ by the multiplicator $\frac{4}{5}$, and thereof commeth $\frac{2}{3}$, which is the multiplicande, or else diuide $\frac{8}{15}$ by $\frac{2}{3}$ and you shall finde the $\frac{4}{5}$ which is the multiplicator.

The proofe of Diuision.

If you doe multiply the quotient by the deuisor, you shall finde the number which you did diuide, that is to saye, your

your diuidend. Example, if you diuide $\frac{2}{3}$ by $\frac{3}{4}$ your quotient will be $\frac{8}{9}$, the profe is thus, you must multiply $\frac{8}{9}$ by $\frac{3}{4}$ and thereof commeth $\frac{24}{36}$ which being abbreuied are $\frac{2}{3}$, which is your diuidend, and by this maner all whole numbers haue their profes as well as broken numbers.

The tenth Chapter treateth of certaine *questions done by broken numbers.* *And first by Reduction.*

Finde two numbers, whereof the $\frac{2}{7}$ of the one number, may bee equall vnto the $\frac{3}{8}$ of ye other. *Answere.* You shall reduce $\frac{2}{7}$ and $\frac{3}{8}$ crossewise, and you shall finde 16, ouer the $\frac{2}{7}$, and 21, ouer the $\frac{3}{8}$, which are the two numbers that you seke: for the $\frac{3}{8}$ of 16 are 6: and so are the $\frac{2}{7}$ of 21, likewise 6: wherefore you may perceaue that the $\frac{3}{8}$ of 16 which are 6, are equall vnto ye $\frac{2}{7}$ of 21, which is also 6.

2. Find two numbers, whereof the

$\frac{2}{3}$ of

$\frac{2}{3}$ of the one, may be double to the $\frac{1}{4}$ of the other. *Aunswere:* double $\frac{1}{4}$, and you shall haue $\frac{2}{4}$, which being abbreuied is $\frac{1}{2}$: then reduce $\frac{2}{3}$ and $\frac{1}{2}$ crossewise, & you shal finde 4 ouer the $\frac{2}{3}$, and 3 ouer the $\frac{1}{2}$, which are the two numbers that you seeke. For the $\frac{2}{3}$ of 3, which is 2. is double vnto the $\frac{1}{4}$ of 4, which is but 1.

3. Find two numbers whereof the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one, may be equall vnto the $\frac{1}{4}$ & $\frac{1}{5}$ of the other. *Aunswere.* Adde the $\frac{1}{3}$ and $\frac{1}{4}$ together, and they make $\frac{7}{12}$, then adde $\frac{1}{4}$ and $\frac{1}{5}$ together, & they are $\frac{9}{20}$: then reduce $\frac{7}{12}$ and $\frac{9}{20}$ crossewise, and you shall haue 140 ouer the $\frac{7}{12}$, and 108 ouer the $\frac{9}{20}$, which are the two numbers that you seeke. For 63 which are the $\frac{7}{12}$ of 108, are also the $\frac{9}{20}$ of 140.

4. Finde two numbers, whereof the the $\frac{1}{2}$ the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one of them, may be equall vnto the $\frac{1}{5}$ the $\frac{1}{6}$ and $\frac{1}{7}$ of the other number. *Aunswere:* firste you must adde $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ togeather and they make $\frac{13}{12}$: then adde $\frac{1}{5}$, $\frac{1}{6}$ and $\frac{1}{7}$ together

gether, and they make $\frac{107}{210}$. Then re-
duce $\frac{13}{12}$ and $\frac{107}{210}$ crossewise, as by the
firste question of reduction, and you
shall finde 2730 ouer the $\frac{13}{12}$, & 1284
ouer the $\frac{107}{210}$, whiche are the two num-
bers that you seeke: for 1391 which
is the $\frac{1}{2}$ the $\frac{1}{3}$ the $\frac{1}{4}$ of 1284; is like[wise]
the $\frac{1}{5}$, $\frac{1}{6}$ and $\frac{1}{7}$ of 2730, whiche is also
1391.

1. Finde three numbers, whereof
the $\frac{2}{5}$ of the first, the $\frac{3}{7}$ of the second, and
the $\frac{4}{9}$ of the thirde may be equall, the
one to the other: Answere, set down
the $\frac{2}{5}$, $\frac{3}{7}$ and $\frac{4}{9}$, and then multiplye the
Denominator of the $\frac{2}{5}$, that is to
say 5 by the Numerators of the other
two Fractions, that is to saye, by the
numerator of $\frac{3}{7}$, and by the numera-
tor of $\frac{4}{9}$, which is 3 and 4, and thereof
commeth 60 for your firste number,
then shall you multiplye the denomi-
nator of the $\frac{3}{7}$ whiche is 7, by the nu-
merators of $\frac{2}{5}$ and $\frac{4}{9}$, that is to saye by
2 and 4 and thereof commeth 56, for
the seconde number. Then multiplye
the denominator of $\frac{4}{9}$, that is to saye, 9
by

by the nu merator of $\frac{2}{5}$ and $\frac{3}{7}$, that is by 2 and by 3, and thereof commeth 54 for the thirde number, and thus the $\frac{2}{5}$ of 60, whiche is 24, is likewise the $\frac{3}{7}$ of 56, whiche is the seconde number and is also the $\frac{4}{9}$ of 54, whiche is the thirde number.

6. Finde three numbers, of which the firste and the second may be in suche proportion, as $\frac{1}{2}$ & $\frac{1}{3}$, and the second and thirde in suche proportion as $\frac{1}{4}$ and $\frac{1}{5}$, Answere, Reduce $\frac{1}{2}$ and $\frac{1}{3}$ crossewyse, and you shal haue 3 ouer the $\frac{1}{2}$, and 2 ouer the $\frac{1}{3}$, then reduce $\frac{1}{4}$ and $\frac{1}{5}$ in lyke maner, and you shall finde 5 ouer the $\frac{1}{4}$, and 4 ouer the $\frac{1}{5}$. Then saye by the Rule of three, if 5 doe giue me 4, what shall 2 giue me, whiche is the seconde proportionall, multiplye the seconde number 4, by the third number 2, and thereof commeth 8, the whiche dyuide by the first number 5, and thereof commeth 1 $\frac{3}{5}$ for the thirde proportionall: and you shall finde that 3, 2, 1 $\frac{3}{5}$, are the three numbers proportionall, which I demaund, or else 15, 10, and 8

in

in wole numbers.

Questions done by Addition in fractions

WHat number is that, vnto th which if you doe adde 13, th whole amounteth to 31 ? Aunswere. Subtract 13 from 31, & there will re maine 18, which is the number ẏ you seeke.

2. What number is ẏ, vnto ẏ whic if you adde $\frac{2}{5}$, the addition will be ? Answere. Abate $\frac{2}{5}$, from $\frac{5}{6}$, and ther will remaine $\frac{13}{30}$, which is the numb that you desire.

3. What nūber is ẏ, wherunto if yo add 7 $\frac{2}{3}$, the whole additiō wil be 12 Answer. Abate 7 $\frac{2}{3}$ from 12 $\frac{1}{4}$, and th remaine will be 4 $\frac{7}{12}$, which is the nu ber that you desire to know.

4. What number is that whereun if you adde the $\frac{3}{4}$ of it selfe, that is t saye, of the number that you seek the whole addition may be $\frac{5}{6}$? Aunswere. Heere followeth a generall rule

for

for all such like questions. First of 3, which is the numerator of $\frac{3}{4}$ make ye still the numerator: and likewise of 3 and 4 added together, which is both the numerator, and the denominator: of the $\frac{3}{4}$, make them your denominator: so you shall find $\frac{3}{7}$: then take the $\frac{3}{7}$ of $\frac{5}{6}$ which is $\frac{15}{42}$ or $\frac{5}{14}$, and substract them from $\frac{5}{6}$, and there will remaine $\frac{10}{21}$, which is the number that you seeke.

5. What number is that, unto the which if you adde his owne $\frac{2}{3}$, that is to say $\frac{2}{3}$ of it selfe, the whole addition shall be 20? *Answere.* doe as in the last question, of the numerator of $\frac{2}{3}$, that is to say, of 2 make still your numerator: and likewise of the numerator 2 and ye denominator 3, of the $\frac{2}{3}$: make of them both your denominator: and you shall find $\frac{2}{5}$, then take the $\frac{2}{5}$ of 20 which are 8, and abate them from 20, and there will remaine 12, which is the number that you desire. And so is to be done in all such like reasons.

M. Questions

WHat number is that, from the which if you doe abate 17, the rest may be 19: *Anfwere*: adde 17, and 19 together, and you fhall find 36, which is the number that you feeke.

2. What number is that, from the which if you abate 1/5, the reft may be 3/8: *Anfwere*. adde 1/5 and 3/8 together: and you fhlt finde 29/40 which is the number that you demaund.

3. What number is that, from the which if you fubftract 13 1/2, ỳ reft may be 5 5/7: *Anfwere*: adde 13 1/2 and 5 5/7 together, and therof cõmeth 19 3/14 which is the number that you feeke.

4. What number is that, from the which if you fubtract his 2/5, that is to fay 2/5 of it felfe, the reft may bee 12: *Aunfwere*: and a rule for, fuch like reafons: that is to fay, from the denominator of 2/5 which is 5 abate 2 which is his numerator: and there refteth 3 for the denominator, and thus of 2/5 you haue now made 2/3: then take the 2/3 of

12 which are 8 and adde them vnto 12, and thereof commeth 20, for the number which you deſire.

5. What number is that, from the which if you doe abate his $\frac{3}{4}$, the reſt may be $\frac{8}{9}$? *Aunſwere* from the denominator of $\frac{3}{4}$ which is 4: ſubtract his numerator 3 and there reſteth 1, thus of $\frac{3}{4}$ you haue made $\frac{3}{1}$: Then multiply $\frac{3}{1}$ by $\frac{8}{9}$ and thereof commeth $2\frac{2}{3}$, the which adde vnto $\frac{8}{9}$, and you ſhall haue $3\frac{5}{9}$: whiche is the number that you ſeeke.

6. What number is that, from the which if you abate his $\frac{4}{5}$, the reſt maye bee $12\frac{2}{3}$? *Aunſwere*. Doe as you did in the laſt queſtion, and you ſhall finde that the $\frac{4}{5}$ wil be $\frac{4}{1}$. And therefore multiplie $12\frac{2}{3}$ by $\frac{4}{1}$, and thereof commeth $50\frac{2}{3}$, the which adde vnto $12\frac{2}{3}$, and you ſhall finde $63\frac{1}{3}$, for the number that you demaunde. And thus of all ſuch like queſtions.

Questions of Multiplication in fraction.

What number is that, which being multiplied by 13, the whole product of that multiplycation shall make 221? Aunswere: diuide 221 by 13, and thereof commeth 17: which is the number that you seeke.

2. What number is that which being multiplied by 15, the whole multiplication will amount to $\frac{3}{4}$? Aunswere: diuide $\frac{3}{4}$ by $\frac{15}{1}$, and therof commeth $\frac{1}{20}$ which is the number that you seeke.

3. What number is that which being multiplyed by 21 the whole multiplication will be $16\frac{4}{5}$? Aunswere. diuide $16\frac{4}{5}$ by $\frac{21}{1}$, and you shall finde $\frac{4}{5}$, which is ye number that you demaund.

4. What number is that which being multiplyed by $\frac{3}{4}$, the multiplication will amount to 18? Aunswere: diuide $\frac{18}{1}$ by $\frac{3}{4}$, and thereof commeth 24: which is the number that you desire to know.

5. What number is that which be-

it be multiplyed by $\frac{2}{3}$ the whole multiplication wil be $\frac{1}{4}$? Answere, diuide $\frac{1}{4}$ by $\frac{2}{3}$ and the quotient will be $\frac{3}{8}$ which is the nūber that you require to know.
6. What number is that, which being multiplyed by $\frac{5}{8}$, the product of the multiplication will bee 16 $\frac{2}{3}$? Aunswere diuide 16 $\frac{2}{3}$ by $\frac{5}{8}$ and therof commeth 26 $\frac{2}{3}$, whiche is the number that you seeke.

Here ensueth other necessary questions which are wroughte by Multiplication in broken numbers.

I Demaunde howe muche the $\frac{5}{8}$ of 20 shillinges are worth, or what are ẏ $\frac{5}{8}$ of 20 shillinges? Aunswere, you must multiply $\frac{5}{8}$ by $\frac{20}{1}$ and the product will be $\frac{100}{8}$, therefore diuide 100 by 8, and thereof commeth 12 $\frac{1}{2}$ which is to saye 12 s̄ 6 d, and so muche are the $\frac{5}{8}$ of 20 shillings worth.
2. I demaunde what the $\frac{1}{4}$ of $\frac{5}{6}$ of a pounde of money are worth? that is

to saye of 20 s? Answere, multiplye $\frac{3}{4}$ by $\frac{5}{6}$, and thereof commeth $\frac{5}{8}$. Then take the $\frac{5}{8}$ of 20 shillings, as in the last question going before, and you shall finde 12 s. 6 d, and so much are the $\frac{3}{4}$ of $\frac{5}{6}$ of 20 s worth.

3. I demaund what the $\frac{2}{3}$ of 8 d $\frac{1}{2}$ are worth? Answere: multiplye 8 $\frac{1}{2}$ by $\frac{2}{3}$, or else $\frac{2}{3}$ by 8 $\frac{1}{2}$, which is all one and you shall fynde $\frac{34}{6}$. Then diuide 34 by 6, and your quotient will bee 5 pence $\frac{2}{3}$, and so muche are $\frac{2}{3}$ of 8 d. $\frac{1}{2}$ worth.

What are the $\frac{3}{4}$ of 14 pence $\frac{3}{5}$? Aunswere: multiplie 14 $\frac{3}{5}$, by $\frac{3}{4}$, and thereof commeth $\frac{219}{20}$: Therefore diuide 219 by 20, and your quotient will be 10 pence $\frac{19}{20}$: and so muche are the $\frac{3}{4}$ of 14 $\frac{3}{5}$.

5. Howe many quarters or fourth partes are contained in 7 $\frac{2}{3}$? Aunswere: multiplye 7 $\frac{2}{3}$ by $\frac{4}{1}$ (because one whole containeth 4 quarters) & thereof commeth 30 $\frac{2}{3}$ and so many quarters are in the 7 $\frac{2}{3}$, that is to say 30 quarters, and $\frac{2}{3}$ of a quarter.

6. How

6. How many thirdes are in $\frac{3}{4}$ and $\frac{1}{2}$, that is to say in 3 quarters and $\frac{1}{2}$ of one quarter: whiche are $\frac{7}{8}$ by the fifte reduction. Answere: multiplie $\frac{7}{8}$ by $\frac{3}{1}$ (for because that in one whole are conteyned 3 thirdes) and thereof commeth $2\frac{5}{8}$, the which $2\frac{5}{8}$ doth signifie $\frac{2}{3}$, and $\frac{5}{8}$ of a thirde: and so manye thirdes are in $\frac{3}{4}$ and $\frac{1}{2}$, or in $\frac{7}{8}$, which is all one.

Questions done by Diuision in broken number.

1. What number is that, whiche being diuided by 17, the quotient will be 13 Answere: multiplye 17 by 13, and therof commeth 221, which is the number that you seeke.

2. What number is that, whiche being deuided by $\frac{3}{4}$, the quotience will be 21? Answere, multiplie $\frac{21}{1}$ by $\frac{3}{4}$, & thereof commeth $\frac{63}{4}$: Then diuide 63 by 4, and thereof commeth $15\frac{3}{4}$: which is the number that you seeke.

3. What number is that, whiche being diuided by $\frac{1}{8}$, the quotiente will

be $\frac{2}{3}$? *Answere:* multiply $\frac{2}{3}$ by $\frac{1}{8}$, and thereof commeth $\frac{2}{24}$, whiche being abreuied are $\frac{1}{12}$ for the number whiche you require.

4. What number is that, whiche being diuided by $\frac{4}{5}$, the quotient will be $16\frac{2}{3}$? *Answere:* multiply $16\frac{2}{3}$ by $\frac{4}{5}$, and thereof commeth $\frac{200}{15}$. Therfore diuide 200 by 15, and therof commeth $13\frac{1}{3}$ which is the number that you desire to finde.

5. What number is that, which being diuided by $13\frac{1}{3}$, the quotient will be 20? Answere, multiply $\frac{20}{1}$ by $13\frac{1}{3}$, and thereof commeth $\frac{800}{3}$, then diuide 800 by 3, and thereof commeth $266\frac{2}{3}$: for the number which you seeke.

6. What number is that, whiche if it be diuided by $12\frac{1}{2}$, the quotient wil be $\frac{7}{8}$? Answere: multiply $12\frac{1}{2}$ by $\frac{7}{8}$, and thereof commeth $\frac{175}{16}$: then diuide 175 by 16, and thereof commeth $10\frac{15}{16}$: for the number which you desire.

Other

Other necessary Questions done by *Diuision in broken number.*

I Demaunde what parte 30 is of 70? Answer, diuide 30 by 70, which you cannot, for they are $\frac{30}{70}$, but abreuy thẽ, and they are $\frac{3}{7}$. Thus 30 are ẏ $\frac{3}{7}$ of 70.

2. I demaund what parte 10 is of $16\frac{2}{3}$? Answere diuide $\frac{10}{1}$ by $16\frac{2}{3}$ and thereof commeth $\frac{30}{50}$, whiche being abbreuied are $\frac{3}{5}$: and thus 10 is found to be $\frac{3}{5}$ of $16\frac{2}{3}$.

3. More, $\frac{5}{8}$ of one vnitie, what parte are they of 25? Answere: diuide $\frac{5}{8}$ by $\frac{25}{1}$, and thereof commeth $\frac{5}{200}$, whiche being abreuied is $\frac{1}{40}$, and thus $\frac{5}{8}$ of 1, is but the $\frac{1}{40}$ of 25.

4. More, $\frac{5}{6}$ what part are they of $\frac{7}{8}$? Answere: diuide $\frac{5}{6}$ by $\frac{7}{8}$, and you shall finde $\frac{40}{42}$, which abreuied, are $\frac{20}{21}$.

5. More, $\frac{4}{5}$ of 1, what parte are they of $13\frac{1}{3}$? Answere: diuide $\frac{4}{5}$ by $13\frac{1}{3}$, and you shall finde $\frac{12}{200}$, which being abreuied are $\frac{3}{50}$. And thus $\frac{4}{5}$ of 1, are the $\frac{3}{50}$ of $13\frac{1}{3}$.

6. More, $12\frac{1}{2}$, what part are they of 30?

30? Answere, diuide 12 $\frac{1}{2}$ by $\frac{30}{1}$, and you shall finde $\frac{25}{60}$, which being abreuied, are $\frac{5}{12}$, and thus 12 $\frac{1}{2}$ are the $\frac{5}{12}$ of 30.

7. More, 16 $\frac{2}{3}$ what part are they of 57 $\frac{1}{7}$? Answere: diuide 16 $\frac{2}{3}$ by 57 $\frac{1}{7}$, & thereof cōmeth $\frac{350}{1200}$, which being abreuied are $\frac{7}{24}$, and thus 16 $\frac{2}{3}$ are the $\frac{7}{24}$ of 57 $\frac{1}{7}$.

8 More, $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{1}{4}$, or 3 quarters of $\frac{2}{3}$ of one quarter, what parte are they of 1? Answere, reduce $\frac{3}{4}$ and the $\frac{2}{3}$ of $\frac{1}{4}$ into a broken number by the fifte reduction, and you shall finde $\frac{11}{12}$. And thus the $\frac{3}{4}$, and $\frac{2}{3}$ of $\frac{1}{4}$, are the $\frac{11}{12}$ of 1 whole.

9. More, of what number are 9 the $\frac{2}{3}$? Answere, diuide 9 by $\frac{2}{3}$, and thereof cōmeth 13 $\frac{1}{2}$, which is the number whereof 9 are the $\frac{2}{3}$.

10 More, of what number are $\frac{2}{5}$ the $\frac{3}{4}$? Answere, diuide $\frac{2}{5}$ by $\frac{3}{4}$, and thereof commeth $\frac{8}{15}$: whiche is the number whereof $\frac{2}{5}$ are the $\frac{3}{4}$ of the same number.

11. More, of what number are 5 $\frac{3}{4}$ the

the $\frac{3}{7}$? *Aunswere*, diuide 5 $\frac{3}{4}$ by $\frac{3}{7}$, and you shall finde 13 $\frac{5}{12}$ which is ẏ number whereof 5 $\frac{3}{4}$ are the $\frac{3}{7}$.

12. More, 9 $\frac{2}{3}$ what part are they of 33 $\frac{1}{2}$? *Aunswere*: diuide 9 $\frac{2}{3}$ by 33 $\frac{1}{2}$, and thereof commeth $\frac{58}{201}$: and thus 9 $\frac{2}{3}$ are the $\frac{58}{201}$ of 33 $\frac{1}{2}$ as appeareth.

The thirde part treateth of certaine briefe rules, called rules of practise, with diuers necessarie qustions, profitable not all onelie for Merchantes, but also for other occupiers.

The first Chapter.

SOme there bee, whiche doe call these rules of practise, briefe rules: for that by them, manie questions maye bee doone with quicker expedition, than by the rule of three. There be others which call them the small multiplication, for because that the producte, is alwaies lesse in quantitye, than the number which is to bee multiplied. This practise commeth not in vse, but onely amonge small kindes of numbers, which haue ouer them, other numbers that ar greater. And this being well considered, is

no

no other thing but to conuerte lesser and particular kindes of number, into greater: the which may be done by ẏ meanes of diuision, in taking the halfe, the thirde, the fourth, the fifte, or such other partes of the summe, whiche is to be multiplyed: as the multiplyer is parte of his greater kinde, and that which commeth thereof, is worth as muche (not in quantitie, but in his owne forme and qualitie) as if you did multiply simply the two summes, the one by the other. And for the better understanding of suche conuersions, you must haue respect to one of these two considerations: the first is, when one woulde demaunde this question. At 6 d. the yarde of Cotton, what are 18 yardes worth by the price? It is manifest that they are worth 18 peeces of 6 pence the peece, or 18 halfe shillings, which must bee turned into shillinges, in taking the halfe of 18 s. and they make 9 s. Or otherwise you must consider, that at 1 s. the yarde, the 18 yardes are worth 18 s. wherefore at

at 6 d. they shall be but halfe so much, for 6 d. is but the $\frac{1}{2}$ of 1 s. Therefore you must take the $\frac{1}{2}$ of 18 s. and they make 9 s. which are worth as much as 108 d. that is to say, as 18 times 6 pence.

An aliquot parte, is any euē part of a shilling or of a pounde, or of anie other thing, as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, &c. are called aliquot parts.

First, if you will multiply any number after this maner, by pence: whereof the number of the same pence do not extend vnto 12, and thereof to bring shil. into the producte: you must know the aliquot parts of 12, which are these, that is to say, 6, 4, 3, 2 and 1. For 6 is the $\frac{1}{2}$ of 12, and 4 is the $\frac{1}{3}$ of 12, 3 is the $\frac{1}{4}$, 2 is the $\frac{1}{6}$, and 1 is $\frac{1}{12}$. Then for 6 d. which is the halfe of 1 shilling, you must take the $\frac{1}{2}$ of all the number which is to bee multiplyed: And that which commeth thereof, shall be shillings: if there doe remayne 1, it is 6 pence.

For foure pence, you must take the $\frac{1}{3}$ of all the number, that is to be multiplyed: and if any vnities doe remaine, they shalbe thirds of a shilling, euerie one beyng in value 4 pence.

For

For 3 pence you must take the $\frac{1}{4}$ of all the summe: if any unityes doe remaine, they shall be fourthes of a shilling, euerie one being worth 3 pence. For 2 pence you must take the $\frac{1}{6}$ of all the summe, and if anye unities doe remaine, they shall bee sixt partes of a shilling, being euery one of thẽ worth 2 pence.

For 1 d. take the $\frac{1}{12}$ of the whole sũme. if anye unities doe remaine, they are the twelueth partes of a shilling eche of them beyng in value 1 d. as by these examples folowing doeth plainely appeare.

Example i.

At 6 pence the yarde.
What are 59 yardes worth?

29 *shil.* 6 *Pence.*

ij.

At 4 Pence the yarde.
What 82 yardes?

27 *shil.* 4 *Pence.*

iij.

iij

At 3 pence the yarde.
What 97 yardes.

24 shil. 3 pence.

iiij

At 2 pence the yarde.
What 346 yardes.

57 shil. 8 pence.

v.

At 1 Penie the yarde.
What 343 yardes.

28 shil. 7 pence.

Here you may see in ẏ first example, that 59 yardes at 6 pence the yard, are worth 29 shillinges 6 d. in taking the $\frac{1}{2}$ of 59. And in the second example, the 82 yerdes at 4 pence the yarde, are worth 27 s. 4 d. in taking the $\frac{1}{3}$ of 82.

The

Likewise, in the third example, 97 yardes at 3 pence the yarde, bringeth 24 shillinges 3 pence, in taking the $\frac{1}{4}$ of 97. Also in the fourth example, 346 yardes at 2 pence the yarde, maketh 57 shillinges 8 pence, in taking the $\frac{1}{6}$ of 346. And finally in the fift example: 343 yardes, at 1 d. the yarde, amount to 28 shill. 7 d. in taking the $\frac{1}{12}$ of 343. And so is to be done of all such like, when the number of the pence is any of the aliquot parts of 12.

But if the number of the pence bee not an aliquot part of 12, you must reduce them into some aliquot partes of 12, and after the aforesayde maner you shall make of them two or three productes as neede shall require, and adde them togither into one summe, as 5 d. may be reduced into 4 d. and a penie, or else into 3 d. and 2 d. For 4 d. and 1 d. do make 5 d. and so do 3 d. & 2 d. the like wherefore if you will worke by 4, and by 1: you must for 4 d. take firste the $\frac{1}{3}$ of the number that is to be multiplyed, and for 1 d. take the $\frac{1}{12}$ of the whole

summe, or rather for 1 d. ye may take the $\frac{1}{4}$ of the product which did come of the 4 d. because that 1 d. is the $\frac{1}{4}$ of 4 d. But if you will worke by 3 d. and 2 d. you shall take for 3 d. the $\frac{1}{4}$ of the number which is to be multiplied, and likewise for 2 d. the $\frac{1}{6}$ of the same number adding togeather boeth the products. The totall summe of those two numbers shall be the solution to the question. And in like maner is to be done of al others As by these examples following may appeare.

Example.

At 5 pence the yard
What will 49 yardes amount unto.

16 *shil.* 4 *pence.*
4 *shil,* 1 *d.*
20 *shil.* 5 *d.*

ij.

At 7 d. the lib.
What will 54 lib cost.

18 *shil.* 0 *d.*
13 *shil.* 6 *d.*

31 *shil.* 6 *d.*

iij.

At 8 d. the peece.
What are 40 worth.

13 *shil.* 4 *d.*
13 *shil.* 4 *d.*

26 *shil.* 8 *d.*

Otherwise.

What are 40 peeces worth.
At 8 d. the peece.

20 *shil.*
6 *shil.* 8 *d.*
26 *shil.* 8 *d.*

iiij.

At 9 d the yard.
What are 73 yardes?

36 *shil.* 6 *d.*
18 *shil.* 3 *d.*

54 *shil.* 9 *d.*

v.

At 10 d. the elle.
What are 32 elles?

16 *shil.* 0.
10 *shil.* 8.

26 *shil.* 8 *d.*

vj.

At 11 d. the lib.
What are 27 lib?

9 *shil.* 0.
9 *shil.* 0.
6 *shil.* 9.

24 *shil.* 9 *d.*

Hem

Here in this first example, where it is demaunded (at 5 pence the yard) what will 49 yardes amount vnto: Fyrste for foure pence, I take the $\frac{1}{3}$ of 49 s. and thereof commeth 15 s. 4 d. Then for 1 d. I take the $\frac{1}{4}$ of the same product, that is to say of 16 s. 4 d. and that bringeth 4 s. 1 d. these two summes added together, do make 20 s. 5 d. And so much are the 49 yardes worth at 5 pence the yard.

For 7 d take the $\frac{1}{3}$ and the $\frac{1}{4}$ of the whole summe which is to be multiplied, & adde them together, that is to say for 4 d you must take the $\frac{1}{3}$, and for 3 d. the $\frac{1}{4}$: because 4 d is the $\frac{1}{3}$ of 12 d. and 3 d is the $\frac{1}{4}$, as in the seconde example before doth appeare. Where the question is thus, at 7 d yͤ li, what wil 54 li cost? First for 4 d I take the $\frac{1}{3}$ of 54: & they make 18 s. Likewise for 3 d. I take $\frac{1}{4}$ of 54, and they are 13 s. 6 d. Then I adde 18 s and 13 s 6 d together, so both amount to 31 s 6 d, and so much are the 54 li. at 7 d. the li.

Otherwise, for 7 d you shall take

first the $\frac{1}{2}$ of the whole summe for 6 d. Then for 1 d. you must take the $\frac{1}{6}$ of the same product, and adde them togither, so you shal haue the like summe as before.

For 8 pence, you must first take $\frac{1}{3}$ of the whole summe for 4 pence: and another $\frac{1}{3}$ for other 4 d. and adde them togither, as in the example doeth euydently appeare. Where the question is thus, at 8 d the peece, what are 40 peeces worth? First for 4 d, I take the $\frac{1}{3}$ of 40, which is 13 s. 4 d. Agayne I take another $\frac{1}{3}$ for the other 4 pence: These two summes being added together, doe make 26 shillinges 8 pence: and so much are the 40 peeces worth, at 8 d the peece, as in the thirde example abouesayd doth appeare.

Otherwayes: for 8 pence you may take first the $\frac{1}{2}$ of the whole summe for 6 pence. Then for 2 d you shall take the $\frac{1}{3}$ of the product which did come of the sayd $\frac{1}{2}$, and adde them together, so shall you haue likewise the solution of the que-

question. As in the same thyrde example of 40 yardes, I take firste the $\frac{1}{2}$ of 40 for 6 d. and thereof commeth 20 s. Then for 2 d. I take $\frac{1}{3}$ of the sayd product, that is to say of 20 s. which bringeth 6 s. 8 d. these two summes (20 s. and 6 s. 8 d.) I adde together, & they make 26 s. 8 d. as before.

For 9 d. you must take the $\frac{1}{2}$ and the $\frac{1}{4}$ of the whole summe, and adde them together: or else for 6 d. take firste $\frac{1}{2}$ of the whole summe, thē for 3 d. take the $\frac{1}{2}$ of the same product, because 3 d. is the halfe of 6 d. And 6 d. added with 3 d. bringeth 9 d. as by the fourth example where it is demaunded after this sorte, at 9 d. the yarde, what are 73 yardes worth? First for 6 d. I take the $\frac{1}{2}$ of 73, and thereof commeth 36 shil. 6 d. Then for 3 d, I take $\frac{1}{2}$ of the same 36 s. 6 d. which is 18 s. 3 d. these two sūmes I adde togither, and they make 54 s. 9 d. as in the same fourth example is euident.

For ten d. take first the $\frac{1}{2}$, then the $\frac{1}{3}$ of the whole summe, and adde them

together, and it is done.

For 11 d take first $\frac{1}{3}$ for 4 d, secondly another $\frac{1}{3}$ for other 4 d, and thirdelye $\frac{1}{4}$ for 3 d (of all the whole summe) and add them together, and that aunswereth the question.

Or else for 11 d, take firste the $\frac{1}{2}$ for 6 d, then the $\frac{1}{3}$ of the whole summe for 4 d, & finally the $\frac{1}{4}$ of the last producte, for 1 d, adding them together, and it will be like to the other.

Likewise by the same reason when you will multiplie (by shillinges) any number that is vnder 20 s. you shall haue in the product poundes, if you know the aliquot partes of 20, whiche are these, 10, 5, 4, 2, and 1. For 10 is the $\frac{1}{2}$ of 20, 5 is the $\frac{1}{4}$ part, 4 is the $\frac{1}{5}$. 2 is the $\frac{1}{10}$, and 1 is the $\frac{1}{20}$.

Then for 10 s. which is the $\frac{1}{2}$ of a pounde, you must take the $\frac{1}{2}$ of the number which is to be multiplied, and you shal haue pounds in the product.

If there doe remayne 1, it shall bee worth 10 shillings.

For

For 5 shillinges, you must take the $\frac{1}{4}$ of the number which is to be multiplied, and if there doe remaine any vnities, they shall be fourth partes of a pound, euery vnity being in value 5 s.

For 4 s. you must take the $\frac{1}{5}$ of the number which is to be multiplied: And if there doe remaine any vnities, they be fift partes of a pounde, euery vnitie being worth 4 shillings.

Example.

At 10 *shillings the peece.*
What are 75 *peeces worth?*

37 *lib.* 10 *shil.*

At 5 *shil. the yarde.*
What are 89 *yardes woorth?*

22 *lib.* 5 *shil.*

At 4 *shil. the elle.*
What are 93 *elles worth?*

18 *lib.* 12 *shil.*

For

For 2 shillinges you must take the $\frac{1}{10}$ of the number that is to be multiplied. Wherefore if you will take the $\frac{1}{10}$ of any number, you must separate the laste figure of the same number, (whiche is nearest your right hande) from all the other figures, with a smal strike or dashe with a penne. For all the other figures which doe remaine towarde your left hande from the same figure that you doe separate shall bee the saide $\frac{1}{10}$ of a pounde: and that figure so separated towarde your right hande shall be so many peeces of 2 shillings the peece: the which figure must be doubled to make thereof shillinges, as by these examples appeareth.

At 2 shil. the lib.
What are 9|8 *lib. worth.*
9 *lib.* 16 *shil.*

At 2 shil. the dosen.
Whet are 40|3 *dosens worth.*
40 *lib.* 6 *shil.*

Heere vp-

Heerevpon dependeth another exact way for to multiply by shillinges (if the number of shillinges bee euen) which is thus: you shall take $\frac{1}{2}$ ye number of the same shillinges, and conuert then into peeces of 2 shillinges. Then by the number of this halfe, you must firste multiply the figure (towarde your right hand, of the number which is to be multiplyed, and if there be any tennes in the same product, those must you reserue in your minde, but if (with the same, or else without the same) you doe finde any diget number, ye same diget number shall you double, & put it in the place of shillings. Then must you proceede to the multiplicatiõ of the other figures, adding vnto ye product the tens whiche you before reserued, and therof shall come poundes.

Now for your better vnderstanding of this which hath beene said, and by ye way of example: I will propone vnto you this question.

At 8 shillinges the grosse, what are 97 grosse worth after the rate?

Fyrst

Frst in this example I take halfe the number of shillings, as before is taught, that is to say, of 8 shillinges which is 4 shillings: this 4 shillings I put apart behind a croked line, right against 9 7 towardes the left hande, as here you may see, and as hereafter appeareth by diuers examples.

At 8 shil. the große.

4) *What will* 9|7 *große cost?*

3 8. *lib.* 16. *shil.*

At 6 shil. the yard.

3) *What* 9|9?

2 9 *lib.* 14 *shil.*

At 12 shil.

6) *What* 34|5?.

207. 0 *shil.*

At 14 shil.

7) *What* 21|0?

147 *lib.* 0 *shil.*

Now

Now in the first example, where it is demaunded at 8 s. the grosse, what are 97 grosse, First the ½ of 8 s. which is 4 s being set apart behind the croked line, as before is saide: then I multiply the 97 by 4, saying first, 4 times 7, is 28. I double the diget number 8, and that maketh 16, the which 16, I doe put under the line, in the place of shillings, and I keepe the two tens in my minde, which heere in woorke doe represent 2 li. Then secondly I multiply 9 by the said 4, and thereof commeth 36, whereunto I adde the 2 li. which before I did reserue, and they make 38. Therefore I put 38 under the line in the place of poundes, and the whole summe will be 38 li. 16 s. Thus much are the 97 groosse worth, at 8 shillinges the grosse: the like is to be done of all other. As of 12 s. in multiplying by 6. Likewise of 6 s. if you multiply by 3: also of 14, if you multiply by 7. And so of all euen numbers after the same maner.

For a shilling you must take the ½ of

of the $\frac{1}{10}$ part of any number that is to be multiplied.

At 1 shil.
What 35|0.
17 li. 10 shil.

And if any thing doe remayn they are shil. Thus by this manner, shil. are conuerted into poundes, for it is euen like as though you did diuide thē by 20 s. as by this example in the margent doth appeare. Where it is demaunded at 1 s ye yarde the peece, or any other thing, what are 330 yards or peeces worth.

First I seperate ye last figure of 350 next to my righte hande, whiche is the 0, with a line betweene it, and the figure 5. Then I make a line vnder the 35|0, & I take the $\frac{1}{2}$ of 35, after this maner saying, the $\frac{1}{2}$ of 3 is 1, and 1 remaineth, whiche remayne signifyeth 10, in that seconde place: Then I put 1 vnder the line agaynst 3, and I proceede to the rest, saying the halfe of 15 is 7, (the which 15 came of the 1 that remayned, & of the 5 in the first place) I put 7 vnder the line, righte agaynst

5.

5.and they make 17 li. The 1 whiche did last remayne, is 10 s. Nowe I put 10 s. apart vnder the lyne, & the whole summe is 17 li. 10 s. so muche are 350 worth, at 1 s. the peece.

But when the number of shillinges is not some aliquot parte of 20 s, you must then conuert the same number of shillings into the aliquot parts of 20, and make two or three productes, as neede shall require, the which must bee added together after this manner following.

For 3 shillinges, you must first take for 2 s. the $\frac{1}{10}$ of the number that is to bee multiplyed, then for one shilling, you muste take the $\frac{1}{2}$ of the producte which did come of the same $\frac{1}{10}$ parte: and adde these two summes together, as appeareth by this example following.

At 3 s. the peece of any thing, what shall 614 peeces cost me after the rate? Answ. for 2 shillinges I take the $\frac{1}{10}$ of

684,

684, whiche is 68, in separating the last figure 4, whiche I must double and they bee 8: I set 8 s̄ aparte

At 3 shil.	
What 68	4.	
	68 li. 8 shil.
	34 li. 4 shil.
	102 li, 12 shil.

from the place of poundes, and th[en] I haue 68 pounds 8 s̄. for the $\frac{1}{10}$ pa[rt] that is to saye for the 2 s̄, secondlye [for] 1 s̄, I take $\frac{1}{2}$ of the producte, that is [to] say, of 68 li. 8 s̄. which is 34 li. 4 s̄. a[nd] I put the same vnder the 68 li. 8 shi[l]. Then finally I ad those two summe[s] togither, that is to say, 68 li. 8 s̄. a[nd] 34 li. 4 s̄. so they make 102 li. 1[2 s̄.] and so much are the 684 peeces wo[rth] at 3 s̄. the peece, as may appeare in th[e] margent.

For 6 shil. take $\frac{2}{10}$ of the numb[er] which is to be multiplied, that is to [say] take firste $\frac{1}{10}$, then double the produ[cte] of the same $\frac{1}{10}$, and adde them togeth[er]. Or otherwise, for 4 s̄. take firste th[e] of the number that is to be multiplie[d], then for 2 s̄. take $\frac{1}{2}$ of the producte, a[nd]

ad[de]

adde them together.

Or else take the 5 shil. the $\frac{1}{4}$ of the whole summe, then for 1 shil. take the $\frac{1}{5}$ of the producte, and adde them togither.

Likewise for 7 shil. take first for 5 s. the $\frac{1}{4}$, then for 2 shil. take the $\frac{1}{10}$ of the number which is to be multiplied, and adde them togither.

For 8 shillinges take the $\frac{2}{5}$ at two sundrie times, that is to say, first $\frac{1}{5}$ for 4 shil. and then as much more for other 4 shil. and adde them together.

For 9 shil. take first the $\frac{1}{2}$ and likewise the $\frac{1}{5}$ of the number that is to bee multiplied, and adde them together.

For 11 shil. take first the $\frac{1}{2}$ for 10 s. then for 1 shil. take the $\frac{1}{10}$ of the product, and add them together, or else for 5 s. take the $\frac{1}{4}$: then for 4 s. take the $\frac{1}{5}$ & lastly for 2 s. take the $\frac{1}{2}$ of the last product, and adde them together.

For 12 shil. take first the $\frac{1}{2}$ for 10 s. then for 2 s. take the $\frac{1}{5}$ parte of the product and adde them togither.

For 13 s. take the $\frac{1}{4}$, then the $\frac{1}{5}$, and again

gaine another $\frac{1}{5}$ of the number which is to be multiplyed, and adde the products together, that is to say: first for 5 shil. take the $\frac{1}{4}$: then for 4 shil. take the $\frac{1}{5}$. And againe another $\frac{1}{5}$ for the other 4 s. and add the three productes together, the like is to be done in all others, when the price of the thing which is valued, is onely of shillings, as by these examples folowing doth plainelie appeare.

At 6 shillinges.

What 67?

13 lib.	8 shil.
6.	14.
20 lib.	2 shil.

At 7 shil.

What 347?

86	15
34	14
121 lib.	9 shil.

At 8 shil.
What 540?

108 lib.	0 shil.
108.	0
216 lib.	0 shil.

At 9 shil.
What 230?

57.	10.
46.	00.
103 li.	10 shil.

At 11 shil.
What 159?

79.	10.
7.	19.
87 lib.	9 shil.

At 12 shil.
What 349?

174.	10.
34.	18.
209 li.	8 shil.

At 13 shil.
What 267?

66. 0	15.
53. 0	8.
53. 0	8.
173 *lib.*	11 *shil.*

Likewise in multiplying by pence, you shal haue (at ỹ first instant) poūdes in the product, in case you know the aliquot partes of the $\frac{1}{10}$ of a pounde, or of 24 pence, whiche are these, 12, 8, 6, 4, 3, and 2. For 12 is the $\frac{1}{2}$ of 24: 8 is the $\frac{1}{3}$: 6 is the $\frac{1}{4}$: 4 is the $\frac{1}{6}$: 3 is the $\frac{1}{8}$: and 2 is the $\frac{1}{12}$: but for 12 d. which is 1 shil. I haue before made mention thereof.

For 8 d. you must take the $\frac{1}{3}$ of the $\frac{1}{10}$, and the rest which are the peeces of 8 d. must be doubled to make of them peeces of 4 d. And of the same number being doubled; you muste take the $\frac{1}{3}$ which will be shillings, & if there doe yet remaine any thing, they are thirds of a shilling, beeing in value 4 pence the peece.

For

For 6 d. take the $\frac{1}{4}$ of the $\frac{1}{10}$, and of that remaineth you must take the $\frac{1}{3}$ which shall be shillings: if there are yet remaine 1 it shall be in value 6 pence.

For 4 d. you must take the $\frac{1}{6}$ of the $\frac{1}{10}$, and of that which resteth take the $\frac{1}{3}$ to make thereof shillings: if any thing doe yet remaine, they are thirdes of a shilling, beeing in value 4 pence the peece.

For 3 pence take the $\frac{1}{8}$ of the $\frac{1}{10}$, and of that remaineth take the $\frac{1}{4}$ to make of them shillinges: if any thing doe yet remaine, they are fourthes of a shilling, everye one of them being worth 3 d.

For 2 d. take the $\frac{1}{12}$ of the $\frac{1}{10}$, and of that which resteth, take the $\frac{1}{6}$, the which are shillings, if there doe still remaine any thing they shal be sixt partes of a shil. every one being in value 2 d.

For 1 d you shall understand that it is not possible with ease to bring of d. poundes (into the product) upon the total summe: But first you must bring

them into shillings, by the order of the second rule of this chapter; and then afterwards you shall conuert them into pounds, if neede so require, as by these examples following may appeare.

At 8 pence.

What 59|6?

19 li. 17 shil. 4 d.

At 6 d.

What 67|8?

16 li. 19 shil.

At 4 d.

What 93|4?

15 lib. 11 sh. 4 d.

At 3 d.

What 57|1?

7 lib. 2 shil. 9 d.

At 2 d.

What 36|4?

3 lib. 0 shil. 8 d.

At 1 d.
What 67|6?

5 lib. 12 shil. 8 d.

2 lib. 16 shil. 4 d.

But if the number of pence, bee not an aliquot parte of 24 pence: Then muste you bring them into the aliquot partes of 24, and make thereof diuers productes which must bee added together, as shall hereafter appeare.

For 5 pence, you shall firste take for 3 pence, than for 2 pence, and ad them together, according to the instruction of the last rule. Or else firste, take for 4 d. and than for 1 d.

For 7 d. take first for 4 d. then for 3 d. and adde them together.

For 9 d. first take for 6 d, then for 3 pence, adding them together.

For 10 d. first take for 6 d. then for 4 d. and adde them together.

For 11 d. take first for 8 d, then for 3 d. and adde them together: as by these examples following doth appeare.

At 5 d.
What 92|7?

11.	11.	9.
7.	14.	6.

19 lib. 6 shil. 3 d.

At 7 d.
What 51|2?

8.	10.	8.
6.	8.	0.

14 li. 18 shil. 8 d.

At 9 d.
What 54|6?

13.	13.	0.
6.	16.	6.

20 lib. 9 shil. 6 d.

At 10 d.
What 27|3.

6.	16.	6.
4.	11.	0.

11 lib. 7 shil. 6 d.

At

At 11 d.
What 26|4?

8.	16	10	1
	6	0	
11 *lib.*	2 *shil.*	o.	

If you wil multiplie any number by shillings, and pence being both together, you must take first for the shil. according to the instruction of the thirde rule of this firste chapter, then take for the pence after the order of the 5 rule, before mentioned: but if there be anye aliquot partes of 1 li. conteining both shillinges and pence, then for those partes you shall take suche like parte of the number that is to be multiplied as the nūber is part of 1 li. the whiche aliquot partes are these, 6 s̄. 8 d̄. 3 s̄. 4 d. 2 s̄. 6 d̄: and 1 s̄. 8 d̄. For 6 s̄. 8 d̄. is the $\frac{1}{3}$ of a li: 3 s̄. 4 d̄. is the $\frac{1}{6}$ of a li. 2 s̄. 6 d̄ is the $\frac{1}{8}$: and 1 shil. 8 pence is the $\frac{1}{12}$ of a li. or of 20 s̄. And therefore for 6 shil. 8 d. you muste take the $\frac{1}{3}$ of the number that is to bee multiplied: and if anye thing doe remayne, they are thirdes

of

of a li. euery one being worth 6 s. 8 pence.

For 3 s. 4 d. you must take the $\frac{1}{6}$ of the number which is to be multiplyed, and if any thing doe remaine, they are sixth partes of a li. euery one being in value 3 s 4 d.

For 2 s. 6 d. you must take the $\frac{1}{8}$: if anye thing bee remaining, they are eyght partes of a li. each one being worth 2 s. 6 d.

For 1 s. 8 d. you shall take the $\frac{1}{12}$ of the number that is to be multiplyed, and if there be any thing remaining, they are twelfth partes of a pound, euery one beeing in value 1 shilling 8 pence.

At 6 shil. 8 d.
What 647?

215 li. 13 shil. 4 d.

At 3 shil. 4 d.
What 220?

36 lib. 13 shil. 4 d.

At

At 2 shil. 6 d.
What 47?

5 li. 17. shil. 6 d.

At 1 shil. 8 d.
What 400?

33 li. 6 shil. 8 d.

Here shall you accustome your selfe to multiplie by all sortes of summes, being composed of shillings and pence, which may come in vse or practise. As thus, for 1 s. 1 d: 1 s. 2 d: 1 s. 3. d: for 1 s. 4 d. Likewise for 2 s. 1 d: 2 s. 2 d: 2 s. 3 d: 2 s. 4 d. And so of all other, considering moreouer many subtile abreuiations, which happen oftentimes, that are easie to be conceiued. As thus, At 11 s. 3 d, after that I haue taken first the $\frac{1}{2}$ for 10 s. Then for 1 s. 3 d. I take the $\frac{1}{8}$ of the product, because 1 s. 3 d. is the $\frac{1}{8}$ of 10 s. in taking the syde $\frac{1}{8}$ of the producte. And by this meane, when yee haue taken one product, ye maye often times vpon ÿ same take another more brieflye than vppon the

the summe that is to bee multiplyed, which thing you must foresee.

At 11 shil. 3 d.
What 53?

26.	10.	0.
3.	6.	3.
29 lib.	16 shil.	3 d.

At 6 shil. 3 d.
What 58?

14.	10.	0.
3.	12.	6.
18 lib.	2. shil	6 d.

At 12 shil. 8 d.
What 64?

32.	0.	0.
8.	8.	0.
2.	2.	8.
40 lib.	10 shil.	8 d.

But if you will multiply by pounds, shillings and pence, being altogether. First you muste wholly multiplye by pounds,

pounds. Then take for the shillings and pence, as in the 6 rule of this chapter is plainely declared. And as by examples following may appeare.

At 3 lib. 6 shil 8 d.
What 49?

147.	0.	0.
16.	6.	8.
163 li.	6 shil.	8 d.

At 5 lib. 18 shil. 4 d.
What 543?

2715.	0.	0.
271.	10.	0.
135.	15.	0.
90.	10.	0.
3212 li.	15 shil.	0 d.

At 2 lib. 7 shil. 4 d.
What 927?

1854.	0.	0.
185.	8.	0.
154.	10.	0.
2193. li.	18. shil	0.

So these rules do serue both to buy and sell. As at such a price the elle, the yarde, the peece, the pound weighte, or any other thing: how muche is such a thing, or so many elles worth? Likewise they are very necessarie to count all peeces of gold and siluer into poundes: for I may as well saye, at 4 shil. 8 d. the French crowne, what are 135 crownes worth, as to saye, at 4 s. 8 d. the yarde of cloth, what are 135 yardes worth.

When any one of the summes which is to be multiplied, is composed of many denominations, and the other being of one figure alone, then shal yee multiply all the denominations of the other summe, by the same one figure, beginning firste with that summe whiche is least in value toward your right hand, and bring the product of those peeces into shillings, and the product of the shillings into poundes, as by this example doth appeare.

At 3 li. 9 shil. 8 d. the peece.

What 7?

24 *li.* 7 *shil.* 8 *d.*

But if in any of the numbers which are to be multiplied, there bee with it a broken number, you must (according to his denominator) take one or manye partes of the other number, as neede doth require: & set the number which commeth thereof under the productes, adding the same together. As thus: At 5 li. 7 s. 8 d. the grosse, what shall 34 grosse $\frac{1}{2}$ cost? First you shal multiply 5 li. 7 s. 8 d. by 34 grosse, saiing 34 times 5 make 170 li. then for 6 s. 8 d. take the $\frac{1}{3}$ of 34, which is 11 li. 6 s. 8 d. Thirdlye, for 1 s. take 34 shil. which is 1 li. 14 s.

At	5. *li.*	7 *shil.*	8 *d.*
What	34 $\frac{1}{2}$?		
	170 *li.*	0 *shil.*	0.
	11	6	8.
	1	14	0.
	2	13	10.
	185 *li.*	18 *shil.*	6 *d.*

Finally for the $\frac{1}{2}$ grosse, you must take $\frac{1}{2}$ of the 5 li. 7 s. 8 d. which is 2 li. 13 s. 10 d. and then adde youre foure products together, so you shall finde, that the 34 grosse $\frac{1}{2}$, at 5 pound, 7 shillings 8 pence

8 pence the grosse is worth 1 8 5 li. 14 s. 6 d. as appeareth in the example foresaide.

And as in this last example, you take for the ½ grosse, take halfe of the price, (that one grosse was worth) And therfore because 1 grosse is worth 5 pound, 7 shillings, 8 pence: the ½ grosse must be worth halfe so much. So likewise if you haue ⅓ of a grosse, or of any other thing, you must take the ⅓ of the price, that one grosse is worth. And in like maner for the ¼ of any thing you shall take the ¼ of the prise, also if you haue ⅔, take the ⅔ of the price that one is worth, and so of all other fractions, as by these examples following may appeare.

At 4 lib. 6 shil. 8 d.

What 46 ½?

184	0.	0.
15	6.	8.
2	3.	4.
201 *li.*	10 *shi.*	0 *d.*

At 8 lib. 0 shil. 9 d.
What $54\frac{1}{3}$.

432	0	0
1	7	0
0	13	6
2	13	7
436 li.	14 shil.	1 d.

At 3 lib. 16 shil. 8 d.
What $17\frac{3}{4}$.

51	0	0
8	10	0
5	13	4
1	18	4
0	19	2
68 li.	00 shil.	10 d.

12. If you will make the proofe of these rules aforesaid, you must first abate the summe of money which ŷ fraction of the multiplycation doeth import) from the totall summe. And divide the rest of the pounds of that said totall summe, by the whole multiplication, the fraction onely accepted. And

if anie thing doe remayne after the diuision is made, that remayne shall be multiplyed by 20: and vnto the product of that multiplication, you shall adde the shillinges whiche remained of the rest of the totall summe. Againe if anye thing doe remayne after the same diuision you must multiplye the same by 12, and vnto the producte adde the pence of the totall summe that remayned, if any be left, and thus if ye haue truely wrought you shall finde agayne the higher summe of your question, that is to say, the price that one grosse or anye other thing is worth, whereof the question is demaunded.

Or otherwise, reduce the remayne of the totall summe (the value of the money that the fraction is worthe, being fyrst reduced) all into pence, in multiplying the pounds by twentie, and the shillinges by 12, adding thereunto the shillinges and pence, which are ioyned with the remaine of the said totall summe if any such bee, then diuide those pence by the foresayde num-

ber

ber that is to be multiplied, ỹ fractiõs of the same number being also abated. So shall you finde the price that one peece, one grosse, or any other thing is valued at. As in the firste of the 3 last examples going before, where the total sūme is 201 poundes, 10 shillinges, from the which I do abate the price of the halfe grosse, which is 2 li. 3 s̄. 4 d̄. the rest is 199 li. 6 s̄. 8 d̄. whiche being reduced into pence, bringeth 47804. I deuide the same by 46, and thereof cō-meth 1040 pence. Then I deuide that 1040 pence, by 12: and they bring 86 shillings 8 pence, that is to saye 4 li. 6 shillinges, 8 pence, whiche is the price that one grosse or any other thing doth cost, as in the fyrst example doth appeare.

The like is to be done of anye maner of thing that is solde by the hundred, after 5 schore to the hundred. As thus, at 12 pound, 7 shillinges, 6 pence the 100 poundes waighte, what shall 74 poundes weighte cost? You shall multiplie 12 pounds, 7 shillings, 6

 pence

pence, by 3 : that is to say by three hundreth. Then for 53 li. weighte you shall take the $\frac{1}{2}$ of 12 li. 7 s. 6 d. because 50 li. is the $\frac{1}{2}$ of 100 li. Likewise for 20 li. weight whiche is the $\frac{1}{5}$ of 100 li. you shall take the $\frac{1}{5}$ of 12 li. 7 s. 6 d. lastly for 4 li. weight you must take the $\frac{1}{5}$ of the last producte. This done, you muste adde all these productes into one summe whiche will make the summe of 46 li. 5 s. 7 d. $\frac{4}{5}$. as by this example aboue written doth appeare.

At 12 li. 7 shil. 6 d.
What 374.

37	2	6.
6	3	9.
2	9	6.
6	9	10 $\frac{4}{5}$.
46 li.	5 sh.	7 d. $\frac{4}{5}$

The proofe is made by reducing the totall summe into pence. And to deuide the producte by the number that is to be multiplied, that is to saye by 374, likewise diuide the quocient produced of that first diuision by 12 : so shall you fynde agayne the highest summe 12 pound 7 s. 6 d. whiche is the

prise

price of 100 li. weight as before.

Also the like may be done of our vsuall waight here in England, whiche is 112 pound, for euery hundred pound waight, in case you knowe the aliquot partes of a hundred, that is to saye, of 112 pounde waighte, which are these, 56 li. 28 li. 14 li, and 7 li. For 56 li. is the $\frac{1}{2}$ of 112. 28 li. is the $\frac{1}{4}$ of 112 li 14 li. is the $\frac{1}{8}$, and 7 li is the $\frac{1}{16}$.

Therefore, for 56 li. take the $\frac{1}{2}$ of the summe of money that the 112 pounde waight is worth.

For 28 pound take the $\frac{1}{4}$ of the summe of money that the 112 pound is worth,

For 14 li. take the $\frac{1}{8}$ of the summe that the C. is worth.

For 7 li. take the $\frac{1}{16}$ of the summe of money that the C is worth.

As thus, at 3 li. 6 s. 8 d. the hundred pounds waight, that is to say, the 112 li. What shall 24 hundred, 3 quarters 21 li. waight cost after the rate.

First, you shal multiply 24 hundred by 3, which is the 3 li. and thereof will come 72 li. then for 6 s. 8 d. whiche is

the $\frac{1}{3}$ of 20 s. you shall take the $\frac{1}{3}$ of 24, whiche is 8 li: for 24 Nobles maketh 8 li. afterwarde, for the 3 quarters of y C. you shal firste for the 56 li. take the $\frac{1}{2}$ of 3 li. 6 s. 8 d because 56 li. is y $\frac{1}{2}$ of the C. and

At 3 li.	6 shil.	8 d.
What 24 C.	3 qu.	21 li.
72	0	0
8	0	0
1	13	4
	16	8
	8.	4
	4	2
83 li.	2 shi.	6 d.

thereof commeth 1 li. 13 shil. 4 d. then for 28 li. (which is the quarter of a C.) you shall take the $\frac{1}{4}$ of 3 li. 6 s. 8 d. or else the $\frac{1}{4}$ of the product, which cometh last of 56 li. which is 16 s. 8 d. likewise for 14 li. you must take the $\frac{1}{8}$ of 3 li. 6 s. 8 d. which is 8 s. 4 d. or else the $\frac{1}{2}$ of the product y commeth of 28 li. which is all one. Finally for 7 li. take the $\frac{1}{16}$ of 3 li. 6 s. 8 d. or else y $\frac{1}{2}$ of the last product that cometh of 14 li. & thereof cometh 4 s. 2 d. Then adde all these products togeather, and the totall summe will be 83 li. 2 s. 6 d. so much are the 24

C. 3 quarters, & 21 li. waight worth after 3 li. 6 s. 8 d. the hundreth, as appeareth in the margine.

The proofe heereof is made like to the other proofes aforesaide; sauing that where in those proofes, you abate the price of the money that the fraction was worth; from the totall summe. Heere in this example (and in such, other like) you must abate the price of ẏ money that the odde waight amounteth vnto, (ouer and aboue the iuste hundreth) from the said totall summe: the rest thereof shall you conuert into pence, diuiding the product of the multiplication by the iust number of the number of the hundreds, so shall you finde the pence, that one hundreth is worth: whiche you shall bring into poundes by the order of diuision, and so of all other.

The second Chapter treateth of the *Rule of three composed, the which is distinct into foure rules, eche of them differing the one from the other.*

There belongeth to the first and second partes of the rule of three composed alwaies 5 numbers: whereof (in the first parte of the rule of three composed) the second number and the fifte, are alwaies of one semblance and like denomination: whose rule is thus. You must multiply ye first number by the second and that shall be your diuisor: then multiply the other three numbers the one by the other to bee your diuidend.

Example of this first part, if 100 crownes, in 12 monethes, doe gaine 15 li. what will 60 crownes gaine in 8 monethes? Answere, first multiply 100 crownes by 12 monthes: and therof commeth 1200 for your diuisor, then multiply 15 li. by 60 crownes, & by 8 monethes, and you shall haue 7200, wherfore diuide 7200 by 1200, and thereof commeth 6 li. so many li. wil 60 crownes gaine in 8 monethes: this questiō may be done by the double rule of 3, that is to say by the rule of 3 at 2 times. But yet this rule of 3 composed

posed is more briefe.

Crownes,	months.	pouds.	crownes.	monthes.
100	12	15	60	8.

1

7200

1200 (6 li.

2. In the second parte of the rule of three composed the thirde number is like unto the fifte, whereof the rule is thus, you must multply the third number by the fourthe, and the producte shall be your diuisor, then multiply the first number by the second, and the product therof by the fift, the which number shall be your diuidend, or number that is to be diuided: as by example.

When 60 crownes in 8 monthes do gaine 6 li. in how many monthes will 100 crownes gaine 15 li. Aunswere, Multiply the third number 6, by the fourth number 100: and thereof commeth 600: which shall be your diuisor, then multiply the first number 60 by the seconde number 8, and the product

duct thereof by the fift number 15 and thereof will come 7200: then diuide 7200, by 600, and the quotient will be 12, in so many monethes will 100 crownes gaine 15 li. This question may likewise be done by the rule of 3 at 2 times.)

Crownes.	months.	pounds.	crownes.	pounds.
60.	8.	6.	200.	15.

1
7̸2̸|00 monethes.
6̸6̸|00 (12

In the thirde parte of the rule of 3 composed, there may be 5 numbers, or more: and in this rule, the first number and the last are alwaies dissemblant and of vnlike denomination the one to the other: and the question is from the last number vnto the first, whereof the rule is thus: you muste multiplie that number which you would knowe by those numbers which doe giue the value, & diuide the product of the same by the multiplication of the numbers which

which are already valued, as by exam-ple. If 4 deniers Parisis bee worth 5 deniers Tournois, & 10 deniers tour-nois, be worth 12 deniers of Sauoy, I demaund how many deniers Parisis, are 8 deniers of Sauoy worth. Aun-swere, multiplie 8 deniers of Sauoye (which is the number that you woulde know) by 4 deniers Parisis, and by 10 deniers Tournois, which are the num-bers that giue the value, & they make 320, then multiply 5 de. tournois, by 12 deniers of Sauoy, whiche are the numbers alreadie valued, & they make 60. Finally, diuide 320 by 60, and you shall finde 5 deniers $\frac{1}{3}$ parisis, so muche are the deniers of Sauoy worth.

Parisis.	tournois.	tournois.	sauoy.	sauoy.
4 d.	5 d.	10 d.	12 d.	8 d.

320 Parisi.
~~60~~ (5 d. $\frac{1}{3}$.

In the fourth part of the rule of three composed, the firste number and the last

last are alwayes semblaunt and of one denomination, & the question of this rule is alwayes from the last number, to the last sauing one. Whereof there is a rule which is thus: You must multiplie that number which you would know, by the numbers that are already valued, and diuide the product of the same by the multiplication whiche cometh of the numbers that giue the value, as by example.

If 4 deniers Parisis, be worth 5 deniers Tournois, & 10 deniers Tournois be worth 12 deniers of Sauoye: I demaund how many deniers of Sauoy are 15 deniers Parisis worth.

Answere. Multiplye 15 deniers Parisis that you would knowe, by 5 Deniers Tournois, and by 12 deniers of Sauoy, which are the numbers alreadie valued, & they make 900, diuyde the same by 4 times 10, which are the numbers that doe giue the value, that is to say by 40, and you shall fynde 22 deniers $\frac{1}{2}$ of Sauoy: so muche are the 15 deniers Parisis worth.

Parisis.	Tournois.	Tournois.	Sauoi.	Parisis.
4 d.	5 ¼ d.	10 d.	12 d.	15 d.

$$\begin{array}{r|l} \not{1}\,2 & \\ \not{9}\not{0} & 0 \quad Sauoy. \\ \hline \not{4}\not{4} & 0 \quad (22\,d.\ \tfrac{1}{2}. \end{array}$$

The thirde Chapter treateth of questions of the trade of Merchandise: in the which is taught the rule of three in Fractions, beginning at the fift question following.

If 31 Deuonsh. dosens. doe cost mee 100 li. 15 shil. what shall 4 dosens cost after the same rate. *Answere*: first bring the 100 li 15 shil. all into shillings, in multiplying the 100 li. by 20, and adding to ÿ product the 15 shil. and thereof commeth 2015 shil. then multiply 2015 by the third nũber 4, and diuide the product by 31, & the quotient will be 260 s. The which diuide again by 20, and thereof commeth 13 li. And so much are the 4 dosens worth.

Dosens

Dosens.	lib.	shil.	Dosens.
31	100.	15.	4

20

2015

4

8060

8060 (260.

If 4 dosens be worth 13 li. What are 31 Dosens worth by the pryce? Answere. Multiply 31 by 13, & thereof commeth 403. The which you shall deuide by 4, and thereof commeth 100 li. $\frac{3}{4}$, which $\frac{3}{4}$ are 15 s. and so muche are 31 Dosens worth, as before.

Dosens.	lib.	Dosens.
4	13	31

13

93

31

403

403 (100 li. $\frac{3}{4}$

3. If 49 elles be worth 2 li. 4 s. 11 d. what are 18 elles worth by the price? First you must bring 2 li. 4 s. 11 d. all into pence, in multiplying 2 li, by 20. maketh 40: adde thereto 4 shillinges they make 44 s: the whiche multiplie by 12 d. and they make 528 d, whereunto adde 11 d. all is 539 d. the whiche 539 d. must bee your seconde number in the rule of three, then multiply 539 by the thyrd 18 number, & therof commeth 9702, diuide ẏ same by 49, & you shall haue in your quotient 198 d. the which diuide by 12, and you shall finde 16 s. 5 pence: so much are the 18 elles worth.

Elles.	lib.	shil.	d.	Elles.
49	2	4	11	18

20	539
44	18
12	4312
88	538
441	
11	
539	9702

1 3		1	
427		76	
886		198	(16 s. 6 d.
9702	(198	122	
4999		1	
44			

4. If 18 elles be worth 16 s. 6 pence what are 49 elles worth by the pryce? Answere, bring 16 shil. 6 d. into pence, in mulciplying 16, by 12 : and thereof commeth 198 d. with the 6 d. added to it, then mulciply 198, by 49, the product will be 9702. The which divide by 18 elles and thereof commeth 539. Then divide 539 d. by 12, and the product thereof by 20. So shall you have 2 li. 4 shil. 11 d. and so muche are the 49 elles worth.

Elles.	shil.	d.	Elles.
18	16	6	49
	12		198
	32		392
	166		441
	198		49
			9702

27	1
441	181
8782 (539	538 (44 shil.
1888	122
11	1

Note that wheras in the first part of this booke, I haue set foorth the rule of three, both in whole numbers, and also in fractions: now I will shew you how to doe the saide rule of three, in fractions more at large. And therfore for that I would haue you to vnderstād ÿ same generally, you must first consider if the three numbers that shall bee proponed (in any question of the saide rule of three) bee all fractions, yea or not which if they be all three numbers fractions: then must you worke as followeth.

First you must multiply the numerators of the seconde and thirde fractions in your rule of three, the one by the other, and againe you must multiplie that product, by the denomina-

tor of the first fraction: And the number which commeth of this last multiplication shall be your diuidend or nūber that must be diuided.

Secondly you must multiply lykewise the denominators of the seconde and thirde fractions if your saide rule of three, the one by the other, and the ofcome, againe by the numerator of the first fraction, and the number which is produced of that multiplication, shall be your deuisor.

Thirdly you must diuide the aforesaid deuidend by the deuisor, and the quotient will be the aunswere to the question, as by Examples shall hereafter appeare

But if you find whole numbers and fractions together, in the saide rule of three, you must first reduce the same in their fractions, by the 6 reduction.

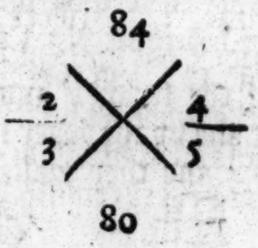
Likewise if you finde anye of the three

three numbers in your rule of three, to be whole numbers, alone without any fraction ioyned with it, you muſt in this caſe put 1 vnder the ſame whole number with a line betweene thē both: The which 1 doth repreſent the denominator to the ſame whole number, and then you muſte proceede to worke the rule of 3 in like maner, as though they were all fractions, as before is ſayd.

The Examples of all three differences *aforeſayd doe follow in the three next queſtions orderly.*

If $\frac{2}{3} \times \frac{4}{5} \quad \frac{7}{8}$: I doe vnderſtande thereby thus as followeth. If $\frac{2}{3}$ of any waight or meaſure, be worth $\frac{4}{5}$ of twenty ſhillinges, or of any other ſum, what are $\frac{7}{8}$ of the like weight or meaſure worth after the rate? Aunſwere, Firſt as is ſayd before. I doe multiply the Numerators of the ſeconde and third fractions, the one by the other: that is to ſaye, 7 by 4, and they make

28; agayne, I doe multiply the sayd 28 by the denominator of the firste fraction, that is to saye by 3: and thereof commeth 84, the whiche 84 I set ouer the crosse for my diuidende. Secondlye I doe multiplye the denominators of the second and third fractions, the one by the other, namely 8 by 5, and they make 40, again I do multiplie the said 40, by the numerator of the fyrste fraction: that is to saye by 2, and thereof commeth 80, the same 80 I doe set vnder the crosse for my diuisor, then I diuide 84 by 80, and there commeth in the quotient, 1 li. and $\frac{4}{80}$ remayning, ẏ whiche $\frac{4}{80}$ being abreuied, maketh $\frac{1}{20}$ of a pound, which is worth 12 pence and so much will the aforesayd $\frac{7}{8}$ coste, as by the worke following doeth appeare.



$$\begin{array}{r|l} 8 & \\ 5 & \cancel{8}\cancel{4}\ (1\frac{4}{80} \\ \hline 40 & \cancel{8}\cancel{0} \\ 2 & \\ \hline 80 & \end{array}$$

6. If $\frac{2}{5}$ of an elle, of any marchandise doe cost me 12 shil. 7 d. the whiche 7 d. doth make $\frac{7}{12}$, what will $\frac{9}{10}$ of an elle cost me after the same rate? Answere: First I set downe my numbers, as followeth. If $\frac{2}{5} \times 12\frac{7}{12}. \quad \frac{9}{10}.$ Then by the sixt reduction, I reduce $12\frac{7}{12}$ al into twelfths, and they make $\frac{151}{12}$ for the seconde nūber in my rule of three, which must stand in the place of $12\frac{7}{12}$. And then will my 3 numbers stande thus as followeth $\frac{2}{5} \times \frac{151}{12} \quad \frac{9}{10}.$ Then I multiplie 151 by 9, and the of come by 5, and thereof commeth 6795 the which I doe set ouer the crosse, for my diuidend. Likewise I multiply 12 by 10, and the of come by 2, and therof commeth 240: whiche I doe set vnder the crosse for my diuisor. Then I deuide 6795, by 240; and there commeth

in the quotient 28 shillinges: and 75 remaining, the which 75 because it is the remaine of shil. I do multiply it by 12 penies, for that there is 12 penies into a shil. and therof cōmeth 900. The same 900 I diuide againe by 240, and thereof commeth 3 penies, and 180 remayning, whiche 180 I doe set aparte ouer 240 with a line betweene them both, and they are $\frac{180}{240}$. The which being abreuied, doe make $\frac{3}{4}$ of a pennie. And thus I finde that the $\frac{9}{10}$ of an elle shall cost 28 s. 3 d. $\frac{3}{4}$, as hereafter doth appeare.

151 | 12 | 6795
12 $\frac{7}{12}$ | 12
| 24 | $\frac{2}{5}$ | $\frac{151}{12}$ | $\frac{9}{10}$
| 127
| 151

240

151 | 12 | 13
9 | 10 | 297
1359 | 120 | 6795 (28 shil.
5 | 2 | 2400
6795 | 240 | 24

75

75 | 1
12 | 8
150 | 900 (3 d. $\frac{180}{240}$.
75 | 240
900 | $\frac{3}{4}$.

7. If $\frac{3}{5}$ of an elle doe cost mee 8 shillinges, what will 7 elles $\frac{1}{2}$ cost me after the rate? Answere, I doe firste reduce the whole number and broken into his broken, by the sixt reduction, that is to saye, 7 $\frac{1}{2}$ into halfes, & they are $\frac{15}{2}$, which must bee the thirde number in my rule of three, the seconde number is 8 shil. but I muste (as before is taughte) put 1 vnder 8 with a line betweene them, to make it like a fraction thus, $\frac{8}{1}$. Then must my three numbers in my rule of three, stande after this manner: $\frac{3}{5} \times \frac{8}{1}$. $\frac{15}{2}$. Then I doe multiply 15 by 8, & the product thereof by 5 amounteth 600: the which I doe set ouer the crosse for my diuidend. Likewise I doe multiply 2 by 1, and the product thereof by 3, and thereof commeth 6, the which I doe set vnder

 the

the croſſe for my deuiſor. Then I deuide 600 by 6, and I finde in my quotient 100, the which is 100 ſhillings, I doe therfore deuide 100 by 20 ſhil. & my quotient is 5 li. And ſo much will the 7 elles $\frac{1}{2}$ coſt me, as hereafter doeth appeare.

$7\frac{1}{2}$ | 7, 2, 14, 1, 15 | 3, 5 — 600 × 6 — $\frac{8}{1}$ — $\frac{15}{2}$

15 × 8 = 120, × 5 = 600 | 2 × 1 = 2, × 3 = 6 | 600 / 666 (100 ſhil. | 100 / 20 (5 li.

If 1 yarde of Veluet coſt 19 ſhilling, what ſhall $\frac{3}{4}$ of a yarde coſt? Anſwere; ſet downe your number thus:

If $\frac{1}{1}$ × $\frac{19}{1}$. $\frac{3}{4}$. Then multiply 1 times 19 by 3: and thereof commeth 57 for

your

your diuidend, or number to be deuided. The which 57 you shall deuide by 1 tymes 1, 4 times, which are 4, & your quotient will be 14 s. $\frac{1}{4}$, which $\frac{1}{4}$ is worth 3 d, so much are the $\frac{3}{4}$ of a yarde worth, after 19 shil. the yarde, as by practise followeth.

57

$\frac{1}{1}$ X $\frac{19}{1}$ 3 | ~~1~~ ~~1~~ 5 7 (14 shil. $\frac{1}{4}$.

4 | 4 4

4

Or otherwise by the rules of practise: first, for $\frac{2}{4}$ of a yarde, which is $\frac{1}{2}$ of a yarde, you must take the $\frac{1}{2}$ of 19 shil. which is 9 s. 6 d. then for $\frac{1}{4}$ of a yarde, take the $\frac{1}{2}$ of the product, that is to say, of 9 s. 6 d. and thereof commeth 4 s. 9 d. adde these numbers together, and you shall haue 14 s. 3 d. as aboue is sayde, and as appeareth here in ye margent a

19 shil.	
9 shil.	6 d.
4	9 d.
14	3 d.

9. If $\frac{3}{4}$ of yarde

of

of Veluet doe coste 14 shil. 3 d. what shall 1 yarde cost? Answere: Set your numbers downe thus: if $\frac{3}{4}$ X $14\frac{1}{4}$. $\frac{1}{1}$. Reduce $14\frac{1}{4}$ into a fraction, and they will be $\frac{57}{4}$, then multiply 57 by 1, 4 times, and thereof commeth 228 for your diuidende. Likewise multiply 1 times 4, 3 times, and thereof commeth 12 for your deuisor, then diuide 228 by 12, and your quotient will be 19 s. so much is the yard of Veluet worth.

228

$\frac{3}{4}$ X $\frac{57}{14\frac{1}{4}}$ $\frac{1}{1}$

12

$\cancel{1}$
$\cancel{10}$
$\cancel{228}$ (19 shil.
$\cancel{122}$
$\cancel{1}$

Or otherwise by the rule of practise, you shall take the $\frac{1}{3}$ part of 14 shilling 3 d. which is 4 s. 9 pence, and adde it with the same 14 shil. 3 d. and you shall haue 19 shil. as before.

14 shil.	3 d.
4	9 d.
19 shil.	0 d.

10. If one elle of Hollande cloth bee worth 5 s. what are $\frac{2}{3}$ worth after the rate? Answere: say thus, if $\frac{1}{1} \times \frac{5}{1}$. $\frac{2}{3}$ Then multiplie 2 tyme 5 one tyme, & thereof commeth 10 for your dividend, likewise multiplie 3 times 1, one time they make 3 for your divisor, then devide 10 by 3, and thereof commeth 3 s. $\frac{1}{3}$, which $\frac{1}{3}$ is worth 4 pence, & so much are the $\frac{2}{3}$ of an elle worth.

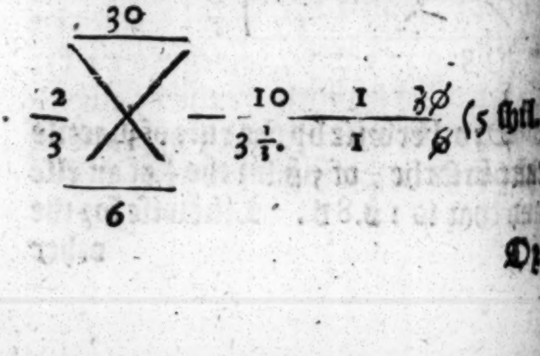
$$\begin{array}{ccc} & 10 & \\ \frac{1}{1} & \times & \frac{5}{1} \\ & 3 & \end{array} \qquad \frac{2}{3} \Big| \begin{array}{l} 1 \\ \cancel{10}\ (3\ \text{shil.}\ \frac{1}{3} \\ \frac{2}{3} \end{array}$$

Or otherwise by the rule of practise take first the $\frac{1}{3}$ of 5 s. for the $\frac{1}{3}$ of an elle and that is 1 s. 8 d. Likewise for the other

other $\frac{1}{3}$ of an elle, take againe another $\frac{1}{3}$ of 5 s. whiche is also 1 shilling 8 d. and adde them together, and so shall you haue 3 s. 4 d. as before.

5 shil.	
1	8
1	8
3 shil.	*4 d.*

11. If $\frac{2}{3}$ of an elle of Hollande Cloth doe coste mee 3 s. 4 d. what shall 1 elle cost? *Answere*, set downe youre numbers thus, if $\frac{2}{3} \times 3\frac{1}{3}$ $\frac{1}{1}$. Firste reduce $3\frac{1}{3}$ all into thirdes, and it will bee $\frac{10}{3}$. Then multiplie 1 times 10, 3 times, & thereof commeth 30, for your diuidend. Likewise multiplie 1 times 3, 2 times, and your diuisor will be 6, then diuide 30 by 6, and you shal haue 5 s. so much is the elle of Holland cloth worth.



Or

Or otherwise by practise, take the $\frac{1}{2}$ of 3 s. 4 d. whiche is 1 shilling 8 pence, and adde it to the same 3 shillinges 4 d. and thereof will come 5 s. as before. For the $\frac{1}{3}$ of 5 s. is as much as the $\frac{1}{2}$ of 3 s. 4 d. which was the price that the $\frac{2}{3}$ of an elle did cost, as appeareth.

3 shil.	4 d.
1	8
5 shil.	0 d.

12. If one elle cost me 17 s. what shall 15 elles $\frac{1}{8}$ part cost? whiche $\frac{1}{8}$ is halfe a quarter of an elle. *Answere*, saye if $\frac{1}{1}$ ✕ $\frac{17}{1}$. 15 $\frac{1}{8}$. Firste reduce 15 $\frac{1}{8}$ in to 8 partes, and they make $\frac{121}{8}$; then multiply 121 by 17, 1 time; and thereof commeth 2057, for your diuidende. Likewise multiplie 8 times 1, 1 tyme, and the product will be 8, for your diuisor, then diuide 2057 by 8, and you shall finde 257 shil. $\frac{1}{8}$, whiche is 12 Li. 17 s. 1 d. $\frac{1}{2}$, & so much are the 15 elles $\frac{1}{8}$ worth, as by practise doeth appeare in the paage following.

$\frac{1}{1}$ $\times$ $\frac{17}{1}$: $\frac{121}{15\frac{1}{8}}$

Or otherwise for 10 s̄. take the $\frac{1}{2}$ of 15, which is 7 li. 10 s̄, then for 5 s̄. take the $\frac{1}{2}$ of 7 li. 10 s̄, whiche is 3 li. 15 s̄, thirdly for 2 s̄. take the $\frac{1}{5}$ of 7 li. 10 s̄. because ẏ $\frac{1}{5}$ of 10 s̄. is 2 s̄. Fourthly for ẏ $\frac{1}{8}$ of the elle, you shall take the $\frac{1}{8}$ of 17 shil. which is 2 shil. 1 penie : $\frac{1}{2}$: Then ad all these summes togither and you shall finde 12 li. 17 s̄. 1 d̄. $\frac{1}{2}$: as before, and as appeareth more playnely in the former practise.

15	$\frac{1}{8}$	
17		
7	10	0
3	15	0
1	10	0
	2	1 $\frac{1}{2}$
12 li.	17 s̄	1 d̄ $\frac{1}{2}$

13. If 25 elles be worth 2 li. 3 s̄. 4 d̄. what are 18 elles $\frac{3}{4}$ worth by the price. Answere: Firste put 3 s̄. 4 d̄. into the part of a li. and you shall haue $\frac{1}{6}$: then say, if $\frac{25}{1}$ giue me 2 li. $\frac{1}{6}$, what shall 18 $\frac{3}{4}$ giue

$\frac{3}{4}$ giue? put the whole numbers into their broken, and then multiply 1 times 13 by 75, the product will be 975, the which you shall deuide by 25 times 6, 4 times, which maketh 600. Then diuide 975 by 600, and youre quotient will be 1 li. and 375 will remaine, the which 375 you shall multiply by 20, and thereof will come 7500 diuide the same by 600: your quotient will be 12 s. and 300 will remaine, the which abreuied is $\frac{1}{2}$ which is 6 pence, thus the 18 elles $\frac{3}{4}$ are worth 1 li. 12 s. 6 d. as by practiise will appeare.

$$25 \quad \frac{13}{2\frac{1}{6}} \qquad \frac{75}{18\frac{3}{4}}$$

Or otherwise by the rules of practise for because that 12 elles $\frac{1}{2}$ is the $\frac{1}{2}$ of 25 elles, therefore take the $\frac{1}{2}$ of 2 li. 3 s. 4 d. which is 1 li. 1 s. 8 d. then for 6 elles $\frac{1}{4}$ take the $\frac{1}{4}$ of 2 li. 3 s. 4 d. or else the $\frac{1}{2}$ of the laste producte (that is to say, of 1 li. 1 s. 8 d.) which is all one, and adde them together, so shall you haue 1 li. 12 s. 6 d. as before.

2

lib.	shil.	d.
2	3	4
1	1	8
	10	10
1 lib.	12 shil.	6 d.

14. If 15 yardes be worth 32 s. what are halfe a yarde and halfe a quarter, or else $\frac{5}{8}$ of a yarde worth? Aunswere, saye if $\frac{15}{1}$ giue $\frac{32}{1}$ what will $\frac{5}{8}$ giue. Multiply 1 times 32 by 5, and deuide the product by 15 times 8 times, and your quotient will be 1 : & $\frac{40}{120}$ remaining, which is $\frac{1}{3}$ of a shil. that is to say 4 d. and so much are the $\frac{5}{8}$ of a yarde worth, that is to say 1 s 4 d.

$\frac{15}{1} \times \frac{32}{1} \quad \frac{5}{8}.$

Or otherwise, see what the yarde is worth after the maner aforesaid, in the other examples, and you shall finde that the yarde is worth 2 s. 1 d. $\frac{3}{5}$: of the which number take firste the $\frac{1}{2}$ for $\frac{4}{8}$ whiche is 1 s. 0 d $\frac{4}{5}$, of the which number, take the $\frac{1}{4}$ for the other $\frac{1}{8}$, which

which is 3 d. $\frac{1}{3}$, and these two numbers together, and you shall find the $\frac{2}{3}$ to be worth 1 s:4 d. as before is said.

2 shil.	2 d.	$\frac{2}{3}$.
1	0.	$\frac{4}{3}$.
	3.	$\frac{1}{3}$.
1 shil.	4 d.	0.

14. If 13 elles $\frac{5}{6}$ be worth 27 shil. what are 10 elles $\frac{2}{3}$ worthe by ye price? Answere: say if 13 $\frac{5}{6}$ giue $\frac{27}{1}$, what shall 10 $\frac{2}{3}$ giue? put the whole numbers into their broken, and you shall finde $\frac{83}{6}$, $\frac{27}{1}$, and $\frac{32}{3}$. Then multiply 6 times 27, by 32, and thereof cometh 5184, the which number you shall diuide by 83 times 1, 3 times, and you shall find 20 shil. $\frac{68}{83}$ which fraction is worth 8 d. $\frac{69}{83}$ parts of a penie.

$$\frac{83}{13\frac{5}{6}} \times \frac{27}{1} \qquad \frac{32}{10\frac{2}{3}}$$

16. If 2 yardes $\frac{1}{2}$ be worth 4 s. 8 d. what are 8 yardes $\frac{1}{4}$ worth? *Answere*,

put the 8 d. into the part of a shilling, setting 8 over 12, & it will be $\frac{8}{12}$ which abbreviated, are $\frac{2}{3}$ then reduce the whole numbers into three broken, and they wil stand thus, $\frac{5}{2}$, $\frac{14}{3}$, $\frac{33}{4}$, then multiply 2 times 14 by 33, and divide the product by 5 times 3, 4 times: and you shall finde 15 s. and $\frac{24}{60}$ will remaine, which are worth 4 d. $\frac{4}{5}$ so much are the 8 yardes $\frac{1}{4}$ worth.

$$2\frac{1}{2} \times 4\frac{2}{3} \quad 8\frac{1}{4}$$

17. If 1 kersey be worth 2 li. 6 s. 8 d. howe manye kersies shall I buy for 36 li. 3 s. 4 d. after the rate: Answere, put 6 s. 8 d. into the part of a li. and you shall haue 2 li. $\frac{1}{3}$, for the firste number in the rule of 3, and 1 kersey for the second number. Then put 3 s. 4 d. into the part of a li. and it is $\frac{1}{6}$, so you shall haue 36 li. $\frac{1}{6}$ for the third number, then will your 3 numbers in the rule of 3, stande thus. $2\frac{1}{3} \times \frac{1}{1} \; 36\frac{1}{6}$. Then reduce the whole numbers into their bro-

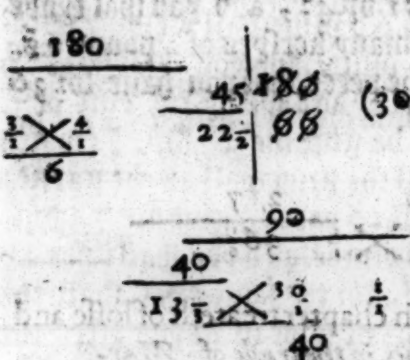
spoken, and it will be thus, $\frac{7}{1} \times \frac{1}{1}$ $\frac{217}{6}$
Then multiply 3 times 1, by 217 and thereof will come 651 for your diuided. Likewise multiply 7 times 1 by 6, and the product thereof will be 42. Then diuide 651 by 42, and you shal fynde $15\frac{1}{2}$. So many kersyes of 2 pound 6 s. 8 pence the peece, shal you haue for 36 li. 3 s. 4 d.

$$\frac{7}{2\frac{1}{3}} \times \frac{1}{1} \quad \frac{217}{36\frac{1}{6}}$$

The fourth chapter treateth of losse and *gaines, in the trade of Marchandise.*

1. If 13 yardes $\frac{1}{3}$ be worth 22 pound 10 s. how shal I sell one yarde, to gayne $\frac{1}{3}$, or to make of 3, 4, which is all one. Answere, saye by the rule of three if 3 doe yeelde 4, what wil 22 $\frac{1}{2}$ yielde, multiply & diuide, and you shal find 30 li. Then say agayne by the rule of three if 13 yards $\frac{1}{3}$ do giue 30 pound as well of principall as of gayne: what will

1 yard be worth by the price ? Multiply and diuide, and you shall finde 2 li. 5 shil. and for that price must the yarde bee solde to gayne the $\frac{1}{3}$, or to make of 3, 4.



Or otherwise, take the $\frac{1}{3}$ part of 22 li. 10 s. which is 7 li. 10 shil. that shall you ad with 22 li. 10 shil, and you shal haue 30 li. as before. Then diuide 30 by 13 $\frac{1}{3}$, and you shall finde 2 li. 5 shi. as aboue is sayd.

li.	sh.
22	10
7	10
30	00

2. If one yard be worth 27 shil. 6 d.

for

for how much shall 16 yards $\frac{2}{3}$ be solde to gayne 2 s. vpon the pound of mony? that is to say, vpon 20 s. *Answere*, adde 2 shil. vnto 20, and you shall haue 22. then say, if 20 s. principall doe giue 22 shil. principall and gayne: how muche will 27 s. 6 d. principall yelde? Multiply and diuide, and you shall finde 30 s. $\frac{1}{4}$: then say agayne by the rule of 3, if 1 yard do giue me 30 shil. $\frac{1}{4}$ (which is as well the principall as the gayne) what shall 16 yards $\frac{2}{3}$ giue me? Multiply and diuide, and you shall finde 25 li. 4 s. 2 d. For the same price shall the 16 yards $\frac{2}{3}$ be solde to gayne after the rate of 2 s vpon the pound of money, or vpon 20 s. which is all one.

			55			121	50
$\frac{20}{1}$	$\frac{1}{2}$	$\frac{22}{1}$	$27\frac{1}{2}$	$\frac{1}{1}$		$30\frac{1}{4}$	$16\frac{2}{3}$

3. If 10 yards $\frac{2}{3}$ be worth 25 li. 10 shil. for how much shall 2 yardes $\frac{1}{4}$ bee solde, to gayne after 10 li. vppon ye 100 li. of money? *Answere*, say if 100 principall yeld 110, as well principall as

gayne, how much wil 25 pound, 10 s. yielde me, multiply and diuide, and you ſhal fynd 28 pound 1 s. Then ſay if 10 yards $\frac{2}{3}$ doe yield me 28 li. 1 s. as wel principal as gaine, howe muche ſhal 2 $\frac{1}{4}$ yield me? Multiply and diuide, and you ſhal find 5 pound. 18 s. 4 d. $\frac{1}{12}$, and for ſo much ſhal the 2 yards $\frac{1}{4}$ be ſolde, to gayne after 10 li. vpon the 100 pound of money.

$$\frac{100}{1} \times \frac{110}{1} \qquad \frac{51}{25\frac{1}{2}}$$

$$\frac{32}{10\frac{2}{3}} \times \frac{561}{28\frac{1}{20}} \qquad \frac{9}{2\frac{1}{4}}$$

And although that in theſe queſtions of gayne and loſſe, ſometimes the firſte number is not like vnto the third number, that is to ſay, of the ſame denomination, for whereas one woulde ſaye, if 20 ſhi. gaine 2 ſhi. what ſhal 50 pounde gayne? or what ſhal 25 li gayne, &c. Or if 20 li. do gaine 2 pound, what ſhal 25 ſhil. gaine? or what ſhal 27 ſhil. $\frac{1}{2}$

gaine

gaine: Yet the same doth not proue that the rule is therefore false. For if 20s. doe gaine 2s. 20 li. shall gaine 2 li. & 20d. shall gaine 2d. likewise 20 crownes, shall gaine 2 crownes: and so of all other. Therefore it is to be vnderstand, that the first number of the rule of three in these reasons, is purposed to be semblable or like to the third, in qualitie or name.

When one Marchant selleth wares to another, and he giueth to the buyer 2 vpon 15: how much shall the buyer gaine vpon the 100, after ye rate? *Ans.* first adde 2 vnto 15, and they are 17, then say if 15 giue 17, what shall 100 giue? Multiply and diuide, and you shall find 113 $\frac{1}{3}$, so the buyer getteth after the rate of 13 $\frac{1}{3}$ vpon the 100.

15. | 17. | 100.

4. If one northen dosen cost me 3 li. 5 s. I sell the same againe for 3 li. 12 s. 6 d. how much doe I gaine vppon the pounde of money after the rate? *Ans.*

 say

ſay if 3 li. $\frac{1}{4}$ doe giue 3 li. $\frac{5}{8}$ what ſhall $\frac{20}{1}$ giue? put ẏ whole number into their broken and you ſhall haue $\frac{13}{4}$ $\frac{29}{8}$ $\frac{20}{1}$, then multiply 4 times 29, by 20: and thereof commeth 2320: for your number that is to be diuided, likewiſe multiply 13 times 8, 1 time, and thereof commeth 104, Then diuide 2320, by 104, and you ſhall finde 22 s. $\frac{4}{13}$. So I ſhall get 2 s. $\frac{4}{13}$ vpon 20 s. or vpon the pounde of money.

$$\frac{13}{3\frac{1}{4}} \times \frac{29}{3\frac{5}{8}} \quad \frac{20}{1}$$

5. If a yarde of cloth coſt me 7 s. 8 d. and afterward I ſelt of the ſame cloth 13 yards $\frac{1}{4}$ for 4 li. 13 s. 4 d. I would know whether I doe winne or loſe, and how much vpon the 100 li. of money; *Anſwere*: ſee firſt at 7 s. 8 d. the yard what the 13 yardes $\frac{1}{4}$ ſhall coſte, and you ſhall finde 5 li. 1 s. 7 d. And I ſold the ſame but for 4 li. 13 s. 4 d. ſo that I doe loſe vpon ẏ 13 yards $\frac{1}{4}$, the ſume of 8 s. 3 d. Then if you will know how much

muche is lost in the 100, saye by the rule of 3, if 5 li. 1 s. 7 d. doe lose 8 s. 3 d. What will 100 li. lose? First put 1 s. 7 d. into the part of a li. and it will be $\frac{19}{240}$. Likewise put 8 s. 3 d. into the part of a li. and it is $\frac{33}{80}$. Then wil your numbers stand thus: 5 $\frac{19}{240}$ X $\frac{33}{80}$ $\frac{100}{1}$ reduce the whole into his broken, and then multiply and diuide, so you shall find 8 li. $\frac{1184}{97527}$, which fraction is worth 2 shil. 5 d. $\frac{150}{1219}$, and so much is lost in the 100 li. of money.

$$\frac{1219}{5\ \frac{19}{240}}\times\frac{33}{80}\quad\frac{100}{1}$$

6. More, if 12 yardes $\frac{1}{2}$ of scarlet, be solde for 30 li. 15 s. vppon the which is gained after the rate of 11 $\frac{1}{9}$ vppon the 100: I demaunde what the yarde did cost at the first? *Answere*. from 30 li. 15 s. substract his $\frac{1}{10}$ parte which is 3 li. 1 s. 6 d. and there resteth 27 li. 13 s. 6 d. the which number multiplyed by 2, bringeth 55 li. 7 s. of the whiche number take the $\frac{1}{25}$, which is 11 li. 1 s.

and

and 4 d. & $\frac{4}{5}$. Then take againe the $\frac{1}{5}$ of the saide 11 pounde, 1 shilling 4 d. $\frac{4}{5}$, which is 2 li. 4 shillings three pence $\frac{4}{25}$. And so much did the yarde cost, at the first penie.

30 *lib.*	15 *shil.*	0 *d.*
3	1	6
27	13	6
2	0	0
55	7	0
11	1	4 $\frac{4}{5}$
2. *lib.*	4 *shil.*	3 *d.* $\frac{4}{25}$

7. More, If 15 yardes $\frac{3}{4}$ of Scarlet, doe cost me 32 li. 13 s. 4 d. And I sell the yarde againe for 2 li. whether doe I winne or lose, or how much in or vpon the pound of money.

Answere. looke what the 15 yardes $\frac{3}{4}$ are worth at 2 li. the yarde, and you shall find that they are worth 31 pound 10 s. But they did cost 32 li. 13 s. 4 d, so that there is loste vppon the whole, 1 li. 3 s. 4 d. Then to knowe howe much

much is lost in the pound, say by ye rule of three, if 32 li. $\frac{2}{3}$ doe lose 1 li. $\frac{1}{6}$, what will $\frac{1}{1}$ lose, that is to say, what wil 1 li. lose? reduce the whole numbers into their broken, then multiplye 1, and diuide, so shall you finde $\frac{21}{588}$ parts of a li. Then multiply 21 by 240 d. because so many pence, are in a pound, and diuide the product by 588, and you shal finde 8 d. $\frac{336}{588}$ which being abreuied do make $\frac{4}{7}$, and thus you see that 8 d. $\frac{4}{7}$ is loste in the pound of money.

$$\frac{98}{32\frac{2}{3}} \times \frac{7}{1\frac{1}{6}} \quad \frac{1}{1}$$

8 If 1 yard of cloth of Tissue be solde for 3 pound 15 s. whereuppon is loste after the rate of 10 s. vpon the 100, I demaund what 12 yards $\frac{1}{2}$ of the same tissue did cost? Answere, adde vnto 3 li. 15 s. his owne $\frac{1}{10}$ parte, which is 7 s. 6 d. and al amounteth to 4 li. 2 shi. 6 d. then looke what the 12 yardes $\frac{1}{2}$ wil amount vnto after 4 pound 2 shil. 6 d. and you shal finde that they wil come

to

to 51 li. 11 s. 3 d. so muche did the 12 yards ½ cost.

	12 ½		
3 li. 15 shil. 0 d.	4 li. 2 shil. 6 d.		
7 6	48	00	0
4 li. 2 shil. 6 d.	1	10	0
	2	01	3
	51 li. 11 shil. 3 d.		

9. More, if I sell one Wilshire white for 6 li. 12 shil. whereupon I doe gaine after the rate of 2 s. upon the pound of money: that is to say, upon 20 s. I demaunde what 11 peeces of the same whites did cost me? *Answere,* from 6 li. 12. (which is 132 shil.) you shal subtract his ¹⁄₁₁ part, that is to saye, 12 s. and there wil remayne 120 shil or 6 li. Then see at 6 li the cloth, what the 11 clothes are worth, and you shall fynde that they are worth 66 pound. And so much did the 11 clothes cost.

132 shil.	11
12 shil	6
120 shil.	66 li.

16: If I sell 10 elles ½ of Hollande for 22 shil. 6 d. whereupon I do lose after the rate of 2 s. in the pound of mony I demaunde what the elle did cost me: *Answere.* say by the rule of three, if 18 giue 20 shil. what wil 22 s. 6 d. giue? Multiply and diuide, and you shal find 25 s. Then diuide 25 s. by 10 ½: and thereof commeth 2 s 4 d. 4/7. So muche did the elle cost.

$\frac{18}{1}$ —— $\frac{20}{1}$ ... 22 ½.

17. If I sel one cloth for 5 li. whereupon I doe lose after 10 in the 100. I demaund how muche I shoulde lose or gaine in the 100, if in case I had solde the same for 5 pounde 10 s. *Answere:* say, if 90 yield 100, how muche wil 5 pound giue? Multiplye & diuide, & you shal find 5 li. 5/9. Then say agayne by the rule of three, if 5 5/9 come to 5 ½, what wil 100 come to? Multiply & diuide, & you shal fynde 99 pound, which being subtracted from 100, there will remayn 1 li. & so much is lost in the 100

The

¶ The 5 Chapter treateth of lengths and bredthes of Tapistrie, and other clothes.

1. If a peece of Tapistrie be 5 elles $\frac{3}{4}$ long, and 4 elles $\frac{2}{3}$ in breadth, how many elles square doeth the same peece contayne. Aunswere: Multiplie the length by the breadth, that is to say 5 $\frac{3}{4}$, by 4 $\frac{2}{3}$, and thereof will come 26 elles, $\frac{5}{6}$. So many elles square doth the same peece contayne.

2. More, if a peece of Tapistrie do contayne 32 elles square, and the same being in length 6 elles $\frac{1}{4}$, I demaunde howe manye elles in breadth the same peece doth contayne. Aunswere, diuide 32 els by 6 $\frac{1}{4}$, and thereof commeth 5 $\frac{3}{25}$. So manye els doeth the same peece contayne.

3. More, a peece of cloth being 13 yardes $\frac{1}{3}$ in length, and 5 quarters $\frac{1}{2}$ a quarter in breadth, how many yardes of $\frac{2}{3}$ & $\frac{1}{2}$ of one thirde broade, will the same

same peece make? *Answere.* see firste by the 5 reduction what part of a yard the $\frac{5}{4}$ and $\frac{1}{2}$ quarter bee, and you shall finde that they make $\frac{11}{8}$, whiche is 1 yarde $\frac{3}{8}$. Then multiply 13 yardes $\frac{4}{5}$ by 1 yard $\frac{3}{8}$, & you shall haue 18 yardes $\frac{?}{?}$ in square, the which you must diuide by $\frac{2}{3}$ & $\frac{1}{2}$ being reduced into one fraction by the fift reduction: that is to say by $\frac{5}{6}$ (because that $\frac{2}{3}$, $\frac{1}{2}$ being brought into one fraction maketh $\frac{5}{6}$) and you shall finde 22 yardes. So many yards of $\frac{2}{3}$ and $\frac{1}{2}$ broade doth the same peece conteine.

4. More, a Marchant hath bought 4 yardes $\frac{2}{3}$ of clothe, beeing sixe quarters and a halfe one quarter broad, to make him a gowne, the which he will line throwout, with blacke Say of $\frac{3}{4}$ of a yard broade: I demaunde how muche Say he must buy? *Answere:* Multiply the length of the cloth, by the bredth, that is to say 4 $\frac{2}{3}$, by 1 $\frac{5}{8}$, (which is the sixe quarters $\frac{1}{2}$ a quarter) and thereof commeth 7 yardes $\frac{7}{12}$, the whiche diuide

uide by $\frac{3}{4}$, and you shall find 10 yardes $\frac{1}{9}$. So many yardes of Say must be haue to line the same 4 yardes $\frac{2}{3}$ of cloth being of 6 quarters and $\frac{1}{2}$ a quarter broade.

5. More, at 6 s. 8 d. the elle square, what shall a peece of Tapistry cost me, which is 5 elles $\frac{1}{2}$ long, and 4 elles $\frac{1}{4}$ broade? Answere: multiply 5 $\frac{1}{2}$, by 4 $\frac{1}{4}$, and thereof commeth 23 elles $\frac{3}{8}$ square: then say by the rule of three, if 1 elle square cost me 6 s. 8 d. what shall 23 $\frac{3}{8}$ elles cost? Multiply & diuide, and you shall finde 7 li. 15 s. 10 d. so much the saide peece of Tapistrie did cost.

Or otherwise, by the rule of practise take the $\frac{1}{3}$ of 23 $\frac{3}{8}$: and you shall finde 7 li. 15 s. 10 d. as aboue is saide.

6. More, a peece of Hollande cloth conteining 42 elles $\frac{2}{3}$ Flemishe, how many elles Englishe doe they make? Heere you must first note, that 100 elles Flemish, doe make but 60 elles Englishe, and so consequently, fiue elles Flemishe, doe make but 3 elles

Englishe,

English. Therefore say by the rule of three, if 5 elles flemish doe make 3 elles Englishe, howe manye elles Englishe will 42 elles $\frac{2}{3}$ flemish make? Multiplye and diuide, and you shall finde 25 elles $\frac{3}{5}$ English, and so many elles English doth 42 elles $\frac{2}{3}$ Flemishe contayne, the like is to bee done of all others.

7. More, I haue bought a peece of Tapistrie, being 5 elles $\frac{3}{4}$ long, and 4 elles $\frac{2}{3}$ broade of Flaunders measure, I demaunde howe manye elles square it maketh Englishe measure: *Answere*: First for as much as 3 elles English, are worth 5 elles Flemish, therefore put 3 elles Englishe into his square, in multiplying 3 by it selfe, which maketh 9: likewise multiplye 5 in it selfe squarely, and it will be 25. Then multiply 5 $\frac{3}{4}$, which is the length of ẏ peece, by 4 $\frac{2}{3}$, which is the breadth thereof commeth 26 elles $\frac{5}{6}$ square: then say by the rule of three, if 25 elles square of Flemishe measure bee worth

9 elles square of Englishe measure, what are 26 elles $\frac{5}{8}$ Flemishe worth? multiply and diuide, and you shall finde that they are worth 9 elles $\frac{3}{50}$ square of English measure.

8. More, at 3 s. 6 d. the elle Flemishe what is the English elle worthe after the rate? Answere: first, say if 5 elles Flemishe be worth 3 elles Englishe, what is one ell Flemish worth? multiply and diuide, and you shall finde $\frac{3}{5}$ of an Englishe elle. Then say againe by the rule of three, if $\frac{3}{5}$ of an english elle, be worth 3 shil. 6 d. what is 1 English ell worth? multiply and diuide and you shall finde 5 s. 10 d. so much shall the English elle be worth.

9. More, at 6 s. 8 d. the Flemishe elle square, what is the english elle worth? Answere, say by the foresaide reason, if 25 els flemish square, be worth 9 els square English, what is 1 elle square Flemishe woorth? Multiplie and diuide, and you shall finde $\frac{9}{25}$ of a square English

Englishe elle. Then say, if $\frac{9}{25}$ of an englishe elle be worth 6 s. 8 d. what is 1 square elle Englishe worth? multiply and diuide, and you shall finde 18 shil. 6 d. $\frac{2}{9}$: so much shall one Englishe elle square be worth.

¶The sixt Chapter treateth of the reducing of the Pawnes of Genes into Englishe yardes.

Note that 100 Pawns do make 26 yards and 1 Pawn is $\frac{13}{50}$ *of a yard after the same rate, and 3 pawnes* $\frac{11}{13}$ *doe make one yard.*

Example.

1. I Haue boughte 97 pawnes $\frac{1}{2}$ of Genes veluet, & I would know howe manye yardes they will make? *Answere*, saye by the rule of 3, if 100 pawnes do make 26 yards, what will 97 $\frac{1}{2}$ make, multiply and diuide, & you shall haue 25 yards, and $\frac{7}{20}$. So many yards do the 97 pawnes $\frac{1}{2}$ contein.

Or otherwise, take some other num-

ber at your pleasure , as 25 pawnes, whiche doe make 6 yardes $\frac{1}{2}$, and then say by the rule of 3, if 25 pawnes doe make 6 yards $\frac{1}{2}$, what wil 97 $\frac{1}{2}$ pawns make? Mulciplye and diuide, and you shall finde 25 yards $\frac{7}{25}$, as before.

More, at 2 shillings 7 d. the pawne of Genes, what will the Englishe yarde be worth after the rate? *Answere*, saye by the rule of 3, if $\frac{13}{50}$ of an englisħ yard be worth 2 shil. $\frac{7}{12}$. What is $\frac{1}{1}$ yarde worth? Mulciply and diuide, and you shal finde 9 s. 11 d. $\frac{3}{13}$, so muche is the english yard worth.

Or otherwise, mulciply 100 pawnes which is 26 yards by 2 s. 7 d. & thereof cometh 258 s. 4 d. the which you must diuide by 29 yards, and you shall finde 9 s. 11 d. $\frac{3}{13}$, as before.

3. If 257 Pawnes $\frac{1}{2}$ bee worth 20 li. 16 shil. 8 d. What is one yarde worth after the rate? *Answere*, say by the rule of three, if 257 $\frac{1}{2}$ pawnes, bee worthe 20 $\frac{5}{6}$, what are 3 pawnes $\frac{11}{13}$ worthe? multi-

Multiply and diuide, and you shal find $\frac{1250}{4018}$ part of a li. which is worth 6 s. 2 pence $\frac{914}{13392}$, and so much is one parpe worth.

¶The vii. Chapter treateth of Marchandise solde by weight.

1. At 9 d. $\frac{1}{2}$ the ounce, what is the li weight worth? *Ans.* say if $\frac{1}{1}$ giue $9\frac{1}{2}$, what will $\frac{16}{1}$ giue? Multiply and diuide, & you shall find 12 s. 8 d. so much is the poūd worth.

Or otherwise, by the rules of practise, for 6 pence, take the $\frac{1}{2}$ of 16: which is 8 s. then for 3 d. take the $\frac{1}{4}$ of 16 shil. which is 4 s. Finally, for the halfpeny, take the 16 ob. which are 8 d. then adde all these numbers together, and you shal finde 12 s. 8 s. as before.

3. More, at 10 d. $\frac{1}{2}$ the ounce: what ar 112 li. weight worth after the rate? *Ans.* reduce 112 pounde into ounces, in multiplying 112 li. by 16 ounces, & you shall haue 1792 ounces, then say

by ẏ rule of 3, if $\frac{1}{1}$ ✕ 10 $\frac{1}{2}$ $\frac{1792}{1}$. Multiply & diuide, & you shal find 18816 d. which doe make 78 li, 8 s. and so much is the 112 pound worth after 10 d. $\frac{1}{2}$ the ounce.

4 At 12 s. 8 d. the li. waight, what is the ounce worth? *Ans.* Put 12 s. 8 d. into pence, & you shall haue 152 pence: then say by the rule of 3, if 16 ounces cost 152 pence, what shal 1 ounce cost? multiplye and diuyde, and you shall finde 9 pence $\frac{1}{2}$, so muche is th ounce worth.

Or otherwise, take the $\frac{1}{4}$ of 12 shil. 8 d. for 4 ounces, and thereof commeth 3 s. 2 d. then for one ounce, take the $\frac{1}{4}$ of 3 s. 2 pence and you shall haue 9 d. $\frac{1}{2}$, as before.

5. At 32 li. 10 s. the quintall, that is to say, the 100 li. waight: what is 1 li. waight worth after the same rate? *Ans.* put 32 li. 10 s. all into shil. and you shal haue 650 s.

Then say by the rule of three, if 100 giue

giue 650, what will 1 giue, multiply & diuide, and you shall finde, 6 s. 6 d. so much is the pounde worth.

6. If one pounde waight of Saffron doe cost me 18 s. 8 d. what shall 355 li. 10 ounces, cost me by the same price? Answere: say by the rule of three, if $\frac{1}{1}$ $18\frac{2}{3}$ $355\frac{5}{8}$. Multiply and diuide, and you shall finde 331 li 18 s. 4 d. so muche are the 355 li. 10 ounces worth.

Breefe rules of waight.

Vho that multiplyeth ẏ d. that 1 li. waight is worth by 5, & diuideth ẏ product therof by 12, he shall find how many pounds in mony ẏ quintall is worth, that is to say, how much the 100 pounde waight is worth.

And contrariwise he that multiplyeth the poundes of money that the 100 li. waight is worth by 12, and diui-

deth the product by 5 shall finde howe many pence the pounde waight is worth.

Example.

At 17 pence the pounde waight, what is the 100 pounde waighte worth? *Aunswer*, multiply 17 by 5 and therof commeth 85, diuide the same by 12, and you shall finde 7 pounde $\frac{1}{12}$ in money, which $\frac{1}{12}$ is worth one shilling and eight pence. So much is the 100 li. waight worth,

More, at 13 li the 100 li. waighte what is one pounde waighte worthe? *Answere*. Multiply 13 by 12, & thereof commeth 156: the which diuide by 5, and you shall finde 31 d, $\frac{1}{5}$ whiche $\frac{1}{5}$ is 2 s. 7 d. and so muche is one pounde waight worth.

The like is to be done of yardes, elles or of any other measure, when we recken but fiue score to the hundred.

Breefe rules for Measure.

Who that multiplyeth the pence, the one

one elle is worth by 2. And diuideth the product by 4, hee shall finde how many poundes in money the 120 elles are worth, which 120 elles we counte but for a C, in this place, because of worke, which measure is vsed for Canuas onely.

Or otherwise, if you diuide the penies, that one elle is worth, by 2: you shall haue in your quotient the pounds that the saide 120 elles are worth, and if any thing remain, they are parts of a pound.

And contrariwise, he that multiplyeth the poundes in money that the 120 elles are worth, by 4, and diuideth the ofcome by 2, shall find how many pence the elle is worth.

Or otherwise if you multiply the poundes that 120 elles are worth, by 2, you shall find in the product how many penies one elle is worth.

Example.

At ten pence the elle, what are 120 elles worth? Answere, multiply 10 d. by

by 2, and thereof commeth 20. The which diuide by 4, and you shall find 5 pound, so many poundes in money are 120 elles worth, at 10 d. the elle.

Or otherwise diuide 10 pennies by 2, and thereof commeth into your quotient 5 which 5 doth represent 5 li. and so many pounds are the 120 elles worth, as before.

More, at 9 pounde the 120 elles, what is one elle worth? Answere: multiply 9 pound by 4, and thereof commeth 36. the whiche diuide by 2, and you shall finde 18 d. so much is one elle worth.

Or otherwise, if you multiply 9 poundes whiche is the price that the 120 elles are worth, by 2, you shall haue the product 18, whiche 18 doth signifie the penies that 1 elle is worth, when the 120 elles doth cost 9 pounde as before.

The like is to be done of all manner of wares, which are sold after 120, for the hundred.

Breefe Rules for our hundreth waight *here at London, which is after* 112 *lib. for the* C.

Who that multiplieth the pence that one pound waight is worth, by 7, & diuideth the product by 15, shall fynde howe many pounds in money the 112 li. weight is worth.

And contrariwise, he that multiplieth the pounds in money, that 112 li. is worth, by 15, and diuideth the product by 7, shall finde howe many pence one pound waight is worth.

Example.

At 9 pence the pounde waight, what is the 112 li. waight worth? *Ans.* multiply 9 d. by 7, and therof commeth 63: the whiche diuide by 15, and you shall finde 4 li. $\frac{3}{15}$, which being abreuied, is $\frac{1}{5}$ of a pound, being worth 4 shil. And thus the 112 li. is worth 4 poundes, 4 shillinges: after the rate of 9 pence the pound.

At 8 li the 112 Li. weighte, what is 1 Li. weight worth. *Answere*, Multiply 8 Li. by 15, and thereof commeth 120, the whiche diuide by 7, and you shall finde 17 d. $\frac{1}{7}$, so muche is 1 Li. waighte worth, when the 112 pound is worth 8 poundes.

¶The eyghte Chapter treateth of Tares *and allowances of Marchandise solde by weight.*

1. AT 12 poūd the 100 suttel, what shal 987 pound suttel be worth, in giuing 4 Li. weight vpon euery 100 for tret? *Answere*, ad 4 Li. vnto 100, & you shall haue 104. Then saye by the rule of three, if 104 be worth 12 Li. what are 987 poūd weight worth: multiply and diuide, and you shall find 113 Li. $\frac{23}{26}$ which is worth 27 s. 8 d $\frac{4}{13}$. So much shall the 987 pound weighte bee worth.

104 / 12 / 987

1. At 6 s. 8 d. the pound waighte, what shall 345 li. $\frac{1}{2}$ be worth in giuing 4 li. waight vppon euerye 100, for the tret. *Answere*, see first by the rule of three, what the 100 pound is worth, saying $\frac{1}{1}$ ╳ 6 $\frac{2}{3}$. $\frac{100}{1}$. Multiplye and diuide, and you shall finde 33 li $\frac{1}{3}$, then adde 4 li. vnto 100, and they are 104, then say againe by the rule of 3, if 104 li. be solde for 33 li. $\frac{1}{3}$, for howe muche shall 345 li. $\frac{1}{2}$ be solde multiply and diuide, and you shall finde 110 li. 14 shil. 8 d. $\frac{12}{13}$. For so much shall the 345 $\frac{1}{2}$ bee solde at 6 shil. 8 d. the pound, in giuing 4 vpon the 100.

3. More, if 100 li. be worth 36 s. 8 d. what shal 780 li. be worth, in rebating 4 li. vpon euery 100, for Tare & Closse *Ans.* Multiply 780 by 4, and thereof commeth 3120. The which diuide by 100, and you shall haue 31 li $\frac{1}{5}$: abate 31 $\frac{1}{5}$ from 780, and there will remayne 748 $\frac{4}{5}$. Then say by the rule of three, if $\frac{100}{1}$ doe cost 39 $\frac{2}{3}$, what will 784 $\frac{4}{5}$ cost after the rate: Multiply and diuide, so

shal

shall you finde 274 s. 6 d. $\frac{18}{25}$, & so much shall the 780 li. cost, in rebating 4 li. vpon euery 100 for Tare and Closse.

4. More, whether doth he lose more, that giueth 5 li. vppon the 100, or hee that rebateth 5 li. in the 100 for tare and closse? *Answere*, First note that he which giueth 5 li. vpon the 100, giueth 105 for 100: and he which rebateth 5 li in the 100, giueth the 100 for 95. Therefore say by the rule of three, if 105 be giuen for 100, for how much shall the 100 be giuen? Multiply and diuide, and you shall finde 95, $\frac{5}{21}$, and hee whiche rebateth 5 in the 100, maketh but 95 of 100, so that hee loseth 5 in the 100, and the other which giueth 5 vpon the 100, loseth but 4, $\frac{16}{21}$ vppon the 100. Thus you maye see that hee which rebateth 5 in the 100, looseth more by $\frac{5}{21}$ in the 100, then the other which gaue 5 vpon the 100 for Tare and Closse.

5. If 100 pound of Allam doe cost mee

26 s. 8 d. how shall I sel the li. waight to gaine after the rate of 10 vppon the 100? *Answere*: put 26 s. 8 d. all into pence, and you shall haue 320 d. Then say by the rule of three, if a 100 giue a 110, what shall 320 giue. Multiplye 320 by 110, and diuide the product by 100, and you shall finde 352 d. Then say againe, if 100 li. be worth 352 d. what is 1 li. worth? multiply and diuide, and you shall haue 3 d. $\frac{26}{100}$, which $\frac{26}{100}$ is worth $\frac{1}{2}$, and $\frac{1}{25}$ of $\frac{1}{2}$, That is to say, the pounde waight shall be worth 3 d. $\frac{1}{2}$, $\frac{1}{25}$ of a halfepeny in gaining 10 vpon the 100.

6. If one pounde waight doe cost me 6 s. 10 d. and I sell the same for 7 s. 2 d. I demaunde howe muche I shal gaine vpon the 100 li. of money after the rate? Answere. say by the rule of 3, if $6\frac{5}{6}$ yeelde $7\frac{1}{6}$ what will $\frac{100}{1}$ yeelde, put their whole numbers into their broken, then multiply & diuide, and you shall finde $104\frac{36}{41}$, from the which subtract 100, and there resteth 4 li $\frac{36}{41}$: so much

much is gained vpon the 100 pound
money after the rate.

7. More, if one pounde doe cost me
5 s. 4 d. and I sell the same againe
4 s. 9 d. I demaunde how much I sh
loose vpon the 100 pounde of mone
Answere, I say, if $5\frac{1}{3}$ doe giue but $4\frac{3}{4}$
what shall $\frac{100}{1}$ giue, put the whole n
ber into their broken. Then multi
and diuide, and you shall finde 89
the which you must subtract from 10
and there will remaine 10 li. $\frac{11}{16}$,
much is lost vpon the 100 li. of mon

8. More, if the li waight doe cost me
3 s. 2 d. and I sell it againe for 4 s. 4
how much shall I gaine vpon 20 sh
Ans. say if $2\frac{5}{6}$ giue $4\frac{1}{3}$, what shall
giue: Multiplie and diuide, and yo
shall finde 27 s. $\frac{8}{19}$, from the which
bate 20 s. and there will remaine 7
$\frac{17}{19}$ which is 4 d. $\frac{8}{19}$, and so much is g
ned vpon the pounde of money, that
to say vpon 20 s.

If the pounde waight doe cost mee [illegible]4 d. and I sell it againe for 3 s. 2 d. I demaunde howe much I shall loose in the pounde of money, that is to say in twentie shillings: *Answere* say if 4 [illegible] giue but 3 $\frac{1}{6}$, what will $\frac{20}{1}$ giue, multiplie and diuide, and you shall finde 14 $\frac{8}{13}$, the which you must abate from 20 s. and there will remaine 5 shil. $\frac{5}{13}$ which $\frac{5}{13}$ is worth 4 d. $\frac{8}{13}$ of a pennie, and so much is lost vpon the pounde of money.

The ix Chapter treateth of certaine *questions, done by the double rule, and also by the rule of three composed.*

A Marchant hath solde wines for the summe of 300 poundes, and he hath gained therein, after 10 li. vpon the 100 li. The question is to know, howe much he gained in all: Answere, say by the rule of three, if 100 li. doe gaine 10 li. what will 300 gaine: multiply and diuide, and you

shall finde 27 li. $\frac{3}{11}$, and so much hath he gained in all.

11. A Marchant hath bought a peece of Hampshire Carsey, conteining 18 yardes, for the price of 4 li. 10 s. The questions is to knowe, howe many yardes hee shall sell for 33 s. 4 d. to gaine 20 s. in the whole peece? Answere, adde 20 s. unto 4 li. 10 s. and they make 5 li. 10 s. Then say by the rule of three if 5 li. $\frac{1}{2}$ doe yelde me 18 yardes, what will 1 li. $\frac{2}{3}$ yielde? multiply and diuide, and you shall finde 5 yardes $\frac{5}{11}$. And so many yardes shall hee sell to gaine 20 s. in the whole peece.

12. A Marchant hath solde Sugers for the summe of 600 li. ready money, and he hath gained in the whole, the summe of 60 li. The question is to knowe, howe much hee hathe gained uppon the 100 li? Answere, first you must subtract 60 li. from 600 li. and there will remaine 540 li. Then say by the rule of three, if 540 li. doe gaine 60

o li. what will 100 li gayne, multi-
ply and diuide, and you shall finde 11
li $\frac{1}{7}$. And so much hath he gayned vpon
the 100 li.

13. More, if 1 li weighte of Maces
doe cost me 5 s. 10 d. and afterwarde I
doe sell the same for 6 shil. the li. to bee
payde for it at the ende of 3 monthes:
I demaunde how muche I shall gayne
vpon 100 li. in 12 monthes after the
rate? *Answere*, Saye by the first part
of the rule of 3 composed: if 5 s. $\frac{5}{6}$ in $\frac{3}{1}$
monthes doe gayne $\frac{1}{6}$ of a shil. whiche
is 2 pence, what will $\frac{100}{1}$ li. gayne in
$\frac{12}{1}$ monthes? multiplie and diuide, and
you shall finde 11 li. $\frac{3}{7}$. And so muche
shall I gayne in 12 monthes, after the
rate.

More, if 1 peece of kersey doe cost
me 36 s. for what pryce maye I sell the
same to be payde for it at the ende of 3
monthes, so that I may gayne thereby
after the rate of 10 li. vppon 100 li.
in 12 monthes? *Answere*, saye by the

firste parte of the rule of 3 composed, if 100 poundes in 12 monthes doe gayne 10 pound, what will 36 s. gayne in 3 monthes, multiplye and diuide, and you shall finde $\frac{1080}{1200}$ of a shilling, the which being abreuied, doeth make $\frac{9}{10}$ of a shilling, which is worth 10 pence $\frac{4}{5}$, the same you must adde with 36 shil. and then you shall haue 36 s. 10 d. $\frac{4}{5}$. And for that price I must sell the peece of kersey, for to gaine therein 10 pound vpon the 100 li. in 12 monthes, and giuing 3 monthes time for the payment.

15. More, if 6 yardes of Northern kersey doe coste mee 8 shil. and I sell 4 yardes of the same kersey for 6 shil, I demaunde whether I gayne or lose, and how much vppon 100 li. of money? Aunswere, First you must seeke what the 4 yardes of kersey did cost: saying by the rule of three, if 6 yardes do cost 8 shillings, what will 4 yardes cost? multiply & diuide, and you shall finde 5 s. $\frac{1}{3}$, and so much did the same

4 yardes cost, therefore abate the same
$5\frac{1}{3}$ from 6 s. and there will remayne $\frac{2}{3}$
of a shilling, which $\frac{2}{3}$ is gayned in the
same 4 yardes of kersey. Then saye a-
gayne by the rule of three, if $5\frac{1}{3}$ doe
gayne $\frac{2}{3}$, what will 100 gayne, multi-
ply and divide, and you shall finde 12,
and $\frac{8}{16}$, whiche $\frac{8}{16}$ being abreuied, is
$\frac{1}{2}$. Therefore it appeareth that I shall
gayne 12 li. $\frac{1}{2}$ upon the 100 li. in sel-
ling 4 yardes of the sayd kersey for 6
shillings.

16. More, a marchaunte hath boughte
a peece of damaske which cost him 8 s.
the yarde ready money, and he selleth
the same agayne to an other marchant,
for 10 s. the yarde, but he geueth two
tymes for the payment, that is to saye,
two monthes for the one halfe, and 5
monthes for the other $\frac{1}{2}$. The questi-
on is to knowe, howe muche the sayde
seconde marchant doth gayne vppon 100
poundes in 12 monthes after the rate a-
foresayd? Answere, you must adde the
2 monthes, and the 5 monthes both

together, and they make 7 monethes
whereof you muste take the one half
which is 3 monthes $\frac{1}{2}$. And at that ti-
the seconde marchaunt oughte to ha-
payd the whole, at one entier payme-
and therefore saye by the firste parte
the rule of three composed: If $\frac{8}{1}$ shil.
3 $\frac{1}{2}$ monthes doe gayne $\frac{2}{1}$ shil. what w-
$\frac{100}{1}$ gayne in $\frac{12}{1}$ monthes? Multip-
and diuyde, and you shall finde
li. $\frac{5}{7}$. And so muche doeth the fy-
Marchaunt gayne vpon the 100 in
monthes.

17. A marchaunt hath bought Velu-
at 13 shil, 6 d. the yarde, ready mony,
he selleth the same for 14 s. 3 pence the
yarde, to be payde $\frac{2}{3}$ parte in ready mo-
ney, $\frac{1}{4}$ parte at 3 monthes, and the
which is $\frac{1}{12}$, is to bee payde to him at
monthes, the question is to know ho-
much the firste marchaunte doth gai-
vppon the 100 li. in 12 monthes af-
the same rate? *Aunswere*, see firste at
what time all the paimentes ought
to bee payde at once: & for to know the
same

time you must multiply euery seuerall payment, by the time it ought to bee paid, & add them together, then diuide the produce by the totall summe of all the payments being added together. And your quotient will shewe at what time al ye paiments ought to bee paide at once, as in the former example, $\frac{1}{4}$ part in ready money is not multiplyed by any tyme, because it is paide presently, then $\frac{1}{4}$ parte beeing multiplyed by 3 monethes maketh $\frac{3}{4}$ of a moneth, and the rest being $\frac{2}{4}$ multiplyed by 5 monethes bringeth 2 $\frac{1}{2}$, then adde $\frac{3}{4}$ and 2 $\frac{1}{2}$ together, and they make 3 monethes $\frac{1}{4}$, the which is the iuste time, that all the paiments ought to be paid at once. And therefore saye by the first part of the rule of three composed, if 3 $\frac{1}{2}$ in 3 monethes $\frac{1}{4}$, doe gaine $\frac{1}{4}$ of a pounde, what will 100 li. gaine in 12 monethes after the rate? multiply and diuide, and you shall find 23 li. $\frac{9}{17}$ so much doth he gaine vppon the 100 li. in 12 monethes.

18. A Marchant hath bought fustians which cost him 22 s. 6 d. the peece ready mony, and he will sell the same at 24 s. the peece. The questiō is to know what time he ought to giue for the payment of the same, to the ende he may gaine after 9 li. vppon the 100 li. in 12 monethes? *Answere*, say if 22 ½ doe gaine 1 ½: what will 100 gaine? multiply & diuide, & you shall finde 6 ⅔ of gaine. Then say againe by the rule of three, if 9 of gaine doe require 12, what will 6 ⅔ of gaine require? multiply and diuide, and you shal find 8 ⅘, which is 8 monethes & ⅘. And so long time ought he to giue, to gaine after the rate of 9 li. vpon the 100 pound in 12 monethes.

19. A Marchant hath bought a peece of Satten being in length 29 yardes, which did cost him 12 poundes and 10 shil. ready mony. I demaund for what price he shall sell the yarde to be paide at the end of 2 monethes, so that he may gaine after the rate of 10 li. vpon the 100 li. in 12 monethes? *Answere*, see first

first what the yarde did cost him at the first, saying by the rule of three, if 20 yardes cost 12 li. 10 shil. what will 1 yard cost, multiplie and diuide, and you shall finde 12 shill and 6 d. Then saye againe by the rule of three, if 12 monethes, doe giue me 10 li. what will 2 monethes giue, multiply and diuide, and you shall finde 1 li. $\frac{2}{3}$. Adde therefore the said 1 $\frac{2}{3}$ vnto 100 and they are 101 $\frac{2}{3}$. Say therefore once againe, by the rule of three, if 100 doe giue mee 101 $\frac{2}{3}$, what will 12 $\frac{1}{2}$ liue? multiply and diuide, and you shall finde 12 shil. and $\frac{17}{24}$ is worth 8 d. $\frac{1}{2}$, and for 12 shil. 8 d. $\frac{1}{2}$ must he sell the yarde of Satten, giuing 2 monethes tyme for the payment to gaine after the rate of 10 li. vpon the 100 li. in 12 monethes.

10. More, if 1 li. waight of Sinamon doe cost me 8 s. readie money, for what price shall I sell 100 li. waighte of the same, to be payde the $\frac{1}{4}$ at 1 month and the residue at the ende of 3 monethes, so that I may gaine after 9 li. vppon

the

the 100 li. in the 12 monthes after the rate? Answere, seeke first in how long time, both the paymentes should bee made at once.

$\frac{1}{4}$.	$\frac{1}{1}$.	$\frac{1}{4}$.
$\frac{2}{4}$.	$\frac{3}{1}$.	$2\frac{2}{4}$.
		$2\frac{1}{2}$. *mont.*

The which to doe: you must multiply each payment of money, by ye time when it ought to be paide, that is to say, you must multiplye the first payment which is $\frac{1}{4}$ part by $\frac{1}{1}$ moneth, and therof commeth $\frac{1}{4}$ of a moneth. Likewise you must multiply ye next payment which is $\frac{1}{4}$ by 3 monthes, & therof will come 2 monethes $\frac{1}{4}$. Then adde $\frac{1}{4}$ of a moneth, and 2 monethes $\frac{1}{4}$ both together, & they make 2 monethes $\frac{1}{2}$ which is the time, that both the paymentes ought to bee payde at once. Then say by the rule of three: if 12 monethes doe geue 9 li. what wyll 2 monethes $\frac{1}{2}$ geue? multiplye and diuide, and you shall finde $1\frac{7}{8}$, say againe by the rule of three. If 1 li. waight do cost me 8 d. what will 100 li. cost? multiplye and diuide, and you shall finde 40 poundes.

Then

Then saye once againe if $\frac{100}{1}$ doe giue 101 $\frac{7}{8}$, what will $\frac{40}{1}$ giue? Multiply & diuide, & you shall fynde 40 $\frac{3}{4}$. And for 40 li. 15 shillinges, I must sell 100 li. waight of Sinamon, to be paid at the 3 seuerall times aforesayde, to gayne therein, after the rate of 9 li. vppon 100 li. in 12 monthes, as by example aforesayd.

10 When the quarter of wheate doth cost 6 s. 8 d. the loafe of bread waying 10 ounces, is solde for a halfepenie, I demaunde that if the quarter of wheat do cost ten shillings, for how much shal the loafe of bread bee sold, that wayeth 16 ounces? you shall aunswere by the first part of the rule of 3 cõposed, which is mentioned in the second Chapter of the third part of this booke, where you may saye by the same firste parte of the rule of three cõposed, if $6\frac{2}{3}$ | $\frac{20}{1}$ | $\frac{1}{2}$ | $\frac{10}{1}$ | $\frac{16}{1}$.

Then multiply the first number by the seconde, and the producte thereof shal be your diuisors. Likewise multi-

ply

plye the other three numbers the one by the other, and the producte thereof shall be your diuidend: as thus, firste multiply $6\frac{2}{3}$ by $\frac{20}{1}$, and thereof commeth $\frac{400}{3}$ for your diuisor, then multiply $\frac{1}{2}$ by $\frac{10}{1}$, and the product thereof by $\frac{16}{1}$, so you shall haue $\frac{160}{2}$ for your number that is to be diuided, then diuide $\frac{160}{2}$ by $\frac{400}{3}$, and thereof commeth $\frac{480}{800}$ the whiche being abreuied, bringeth $\frac{3}{5}$ of a penie: and for that price must the loafe of bread be solde, whiche wayeth 16 ounces, when the quarter of wheat is worth 10 shillings.

Or otherwise, by the rule of three at two times. Firste saye, if $\frac{20}{1}$ ounces giue $\frac{1}{2}$, what will $\frac{16}{1}$ ounces giue: multiply and diuide, and you shall finde $\frac{2}{5}$ of a penie. Then say againe, if $6\frac{2}{3}$ doe giue me $\frac{2}{5}$, what will $\frac{10}{1}$ giue: Multiply and diuide, and you shall finde $\frac{3}{5}$ of a penie, as before is sayd.

21. Whē the cariage of one hundred waight of marchandise 50 myles doth cost 5 s. what shall the cariage of 500 waight

waight cost me for 16 miles. Answere. By the first parte of the rule of 3 composed, saying, if 100|50 5 | 500|16. Multiply 100 by 50, the product will be 5000, which shall be your diuisor. Then mulciply 5 times 500 by 16, and thereof commeth 40000 for your diuidend. Therefore diuide 40000 by 5000, and you shall finde 8 s. so much shal cost the cariage of 500 waight 16 miles.

Or otherwise, by the double rule of three, that is to say by the rule of three at two times: first say, if 50 miles doe pay 5 s. what shall 16 miles pay, multiply and diuide, and you shall finde 1 s. $\frac{3}{5}$. Then say againe, if 100 waighte doe cost mee 1 s. $\frac{3}{5}$, what shall 500 waight cost? Mulciply and diuide, and you shall finde 8 s. as before.

22. When the cariage of 100 pounde waight of marchandise 84 miles, doth cost me 6 s, howe many miles maye I haue 64 pounde waight caried for 3 s. 4 d. Answere: by the second part of the rule

rule of three composed, and saye if $\frac{100}{1} \mid \frac{84}{1} \mid \frac{6}{1} \mid \frac{64}{1} \mid 3\frac{1}{3}$.

Then multiplye the fourth number $\frac{64}{1}$ by the third number $\frac{6}{1}$, and thereof cometh $\frac{384}{1}$ for your diuisor. Likewyse multiply $3\frac{1}{3}$ by $\frac{100}{1}$, and by $\frac{84}{1}$, & you shall haue in the product $\frac{8400}{3}$: the diuide $\frac{8400}{3}$ by $\frac{384}{1}$, and you shall find 72 miles, & $\frac{11}{12}$ of a mile. So many myles shall the 64 li. weight be caried, for 3 s. 4 d.

Otherwise by the rule of three, at two times: First, saye if 100 weight do cost mee 6 shil. what shal 64 pound weight cost? Multiply and diuide and you shall finde 3 s. $\frac{21}{25}$. Then say if 3 $\frac{21}{25}$ be payd for 84 miles cariage: for how many miles shall 3 s. $\frac{1}{3}$ be payde? Multiply and diuide, and you shall finde 72 miles $\frac{41}{12}$, as before.

23. If 100 horses, in 100 dayes, do spend 180 quarters of otes: howe manye quarters of oates will 350 horses spend in 150 dayes? *Answere:* by the first part of the rule of three composed, you must multiply 180 times 350, by

150:

350: and diuide the product by 100 times 100: and you shall finde 945 quarters. So many quarters of otes will 350 horses spende, in 150 daies.

Or otherwise by the rule of 3 at two times: first say, if 100 daies doe yelde me 180 quarters of otes: what shall 150 daies yelde? multiply and diuide and you shall finde 270 quarters: then say againe, if 100 horses doe spend 270 quarters of otes, how many quarters of otes will 350 horses spend? Multiply and diuide, and you shall finde 945 quarters as before.

The tenth Chapter treateth of the Rule *of fellowshippe, without any time limited.*

THE rule of fellowshippe is thus: you muste sette downe each mans summe of money that hee layeth in companie, euerie one directlie vnder the other, the which sums you shall adde all together, and the totall summe

summe of all their whole stockes being thus assembled shall be your common deuisor, to the finding out of euery mans part of the gaine, then you shall multiply either the gayn or else ỳ losse, which so euer of them doeth happen by eache mans portiō of money ỳ he layde in, and deuide the products by the same diuisor: so shall you haue in your quotient euery mans part of the gayne, if any thing be gained, or els of the losse, if anye thing be lost.

Example.

1. Two Marchauntes haue laide their money in company together, the first layde in 500 li. The seconde layde in 300 li. and with occupying they haue gained 60 li. I demaunde, how much each man shall haue of the said gaines according to the money they laide in: Answere: adde 500 and 300 both togeather, whiche are the parcels or summes that they both laide in, and thereof commeth 800 for your diuisor: then say, by the Rule of three,

800 li. which is their whole stocke) gayn 64 pound, what shal 500 poūd gayne? (which is the first mans money that he layde in) multiplye and diuide, and you shall finde 40 li. for the firste mans part of the gain: then say, if 800 giue 64: what will 300 giue? Multiply and diuide, and you shall finde 24 pounde for the second mans part of the gayne.

500				
300	800	64	500.	
800				
	800	64	300.	

Or otherwise, put 500 li. which is the first money that hee layde in, ouer the 800 li. which is the whole stocke, and you shal haue haue $\frac{500}{800}$, which being abbreuiated, do make $\frac{5}{8}$ and such part of the gayne shall the firste man take, that is to say $\frac{5}{8}$, of 64 li. which is 40 li. and consequently, by the same maner, the second shall take the $\frac{3}{8}$ of 64, whiche is 24 pound, for his part of the gayne, as

before.

5	00	3	00
8	00	8	00

7. Two Marchants haue companyed together, the first layde in 640 li. & he taketh $\frac{5}{8}$ partes of the gaine. I demaunde howe much the seconde Marchant layde in, *Answere*, seeing that the first Marchant taketh $\frac{5}{8}$ of the gain it followeth that the second Marchant must haue $\frac{3}{8}$ whiche is the reste, and therefore say by the rule of three, if $\frac{5}{8}$ of the gaine which the fyrste man taketh did lay into the stocke $\frac{640}{1}$. Howe much shall $\frac{3}{8}$ of the gayne lay in which is the second mans gaine? Multiplye and diuide, and you shall finde 384 li. so much ought the seconde man to laye into company.

8. Two Marchants haue companyed togither, the firste man laide in 640 li. and the seconde hath layde in so muche money for his parte, that hee muste haue 60 li. for his part of 100 li.

li. that they haue gayned. I demaunde howe muche the seconde man did laye into company? *Aunswere*: seing that the seconde man taketh 60 li. of the gayne, it followeth that the first must haue the rest of 100 li. which is but 40 li. Therefore say by the rule of 3, if 40 li do lay in 640 li. what shall 60 li lay in. Multiply & diuide, & you shall finde 960 li. So much did the seconde marchaunt lay in.

4. Two marchaunts haue companied together, the first laid in 83 li. 6 s. 8 d. the seconde layde in 170 duckets: and they haue gayned 100 li. of the which the first man muste haue 60 li. I demaunde what the ducket was worth? *Answere*, seeing that the firste man muste haue 60 li. it followeth that the seconde must haue 40 li. therefore saye by the rule of three, if 60 li. of gayne, that the first man taketh, did lay in 83 li. 6 s. 8 d. principall, howe much shall 40 li. gayne put in, which is the gaine

 that

that the seconde man taketh; multiplye and diuide, and you shall finde 55 li. $\frac{5}{9}$, somuche are the 170 duckets worth. Then put 55 li. $\frac{5}{9}$ into shillinges, and you shall haue 1111 s. $\frac{1}{9}$. So then for to know what the ducket is worth, say by the rule of 3, if $\frac{170}{1}$ giue 1111 $\frac{1}{9}$, what will $\frac{1}{1}$ giue: Multiply and diuide and you shall finde 6 s. 6 d. $\frac{22}{51}$: so much is the ducket worth.

5. Two marchaauntes haue companied together, the second man layde in more by 30 li. then did the firste man: and they gayned 120 li. of the whiche the firste man oughte to haue 50 li. I demaund what ech of them did lay in? *Answere*, from 120 li. abate 50 li. and there resteth 70 li. for the second mans part: so that by this meane the seconde man, because hee layde in 30 li. more then the first man did, taketh 20 pound more of the gayne, and therefore say by the rule of 3, if 20 li, gaine did lie in 30 pound principall, how much shall 50 li. gayne lie in? Multiplye & diuide, and you

you shall finde 75 li. so muche did the first man lay in, and consequentlye the second layd in 105 li.

6. Two Marchauntes haue companied together, the second hath layde in twise so much as the first man did and 10 li. more: and they haue gayned 100 li. of the which the firste oughte to haue 32 li for his parte: I demaunde howe muche eche of them did laye into cõpany? *Ans.* If it were not for the 10 li. that the second man layd in more then the first, he shoulde haue had but 64 li. of the gaine, whiche is the double of the firste mans parte. But because he layde in 10 li. more, he hath therefore 4 pounde more of the gayne, and therfore say by the rule of three, if 4 li. gayne did lay in 10 pound of principall (whiche was ouer & aboue the double of the first mans laying in) what shall 32 li. of gaynes lay in? which is ẏ firste mans part of the gaynes that hee taketh. Multiplye and diuide and you shall finde 80 pound for the first mans laying in: and consequently 150 poũd

for the second mans portion that he laied in.

7. Two marchants haue companied together, and they haue gayned 100 li. of the whiche the first must haue after the rate of 10 li. vppon the 100 li. and the second must haue after the rate of 15 li. vppon the 100 li. I demaunde how much eche of them ought to haue *Answere*, Put 10 li. for the firste mans laying in, & 15 li. for the seconde mans laying in. Adde therefore 10 li. and 15 li. together, and they make 25 li. Then put 10 ouer 25, & it is $\frac{10}{25}$, which being abreuied are $\frac{2}{5}$. Therefore hee that taketh 10 li. vpon the 100 li. must haue the $\frac{2}{5}$ of the gayne, which is 40 li. Then put 15 ouer 25, & it is $\frac{15}{25}$, which being abreuied are $\frac{3}{5}$. Therefore the second must haue $\frac{3}{5}$ of the 100 li. which is 60 li.

8. Two marchantes haue companied together, the first layde in 46 li. 18 s. and the seconde layde in 33 li. 2 shil. so they

they haue gained 30 li. I demaunde how muche euery man shall haue for his parte of the gaine? Answere, Adde 46 li. 18 s. and 33 li. 2 s. both together: and you shall finde 80 li. for your common diuisor, then say if 80 li, which is all their stocke, doe gaine 30 li. what will 46. $\frac{9}{10}$ gaine? which is the money that the first man laide in? Multiply & diuide and you shall finde 17 pound 11 shil. 9 pence for the first mans parte of the gaine. Then say againe by the rule of three: if 80 li. doe gaine 30 li. what will 33 li. $\frac{1}{10}$ gaine, which was the second mans money, that he laid in: multiply & diuide & you shall find 12 li. 8 s. 3 d. for the seconde mans parte of the gaine.

And after the same maner shal you do in case there were three or foure Marchants that would company together, adding all & euerye of their summes of money (which they lay into y^e stocke) into one totall summe: which shall be your common diuisor: & then worke with the reste, as is taught in the former

ner question of the rule of company.

Example.

9. Three Marchants haue compa-nied togither, the fyrst laide in I know not howe muche: the seconde did put in 20 peeces of cloth: and the thirde hath laide in 500 pounde. So at the ende of their company, there gaines a-mounted vnto a 1000 li. whereof the first man ought to haue 350 pounde, & the second must haue 400 pounde.

Now I demaunde howe much the first man did lay in, and for how muche the 20 peeces of cloth, were put into company.

Answere.

Seeing that in the first and the se-cond Marchauntes must haue 750 li. for their partes of the gaine. Then the thirde man must haue the rest of the 1000 li. which is 250 li. And there-fore say by the Rule of three, if 250 li.

gaine

gaine, be come of 500 li. principall, of how much shall come 350 li. gaine: which the first man taketh, multiply and diuide, and you shall finde 700 li. So much did the first man lay in: then say if 250 li gaine, become of 500 li. principall, of howe muche will come 400 li. which is the gaine that the second man taketh. Multiply and diuide, and you shall finde 800 li. For that price were the 20 peeces of cloth laide into company.

10. Three Marchants haue gayned 100 li. the first must haue the $\frac{1}{2}$, the second must haue $\frac{1}{3}$. And the third muste haue $\frac{1}{4}$. I demaunde how much euery man must haue of the gaine? Answere. Reduce $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$, into a common denomination, after the order of the second reduction in Fractions, and you shall finde $\frac{12}{24}$, for the $\frac{1}{2}$, $\frac{8}{24}$, for the $\frac{1}{3}$ and $\frac{6}{24}$, for the $\frac{1}{4}$: Then take 12 for the first mans laying in, 8 for the seconde mans laying in, and 6 for the thirde mans laying in. The whiche three

three numbers being added together, shall be your common diuisor, and they doe make 26. Then multiply 100 li. by 12, for the first man: then againe 100 li. by 8 for the second: and last of all 100 li. by 6 for the third man. And diuide the products of euery multiplication by 26. So shall you finde 46 li. $\frac{2}{13}$ for the first mans parte of the gaine 30 li. $\frac{10}{13}$ for the second mans parte, and 23 li. $\frac{1}{13}$ for the third mans parte.

11. Two Marchants haue gained 100 li. the firste muste haue $\frac{1}{2}$ and 5 li. more, the seconde must haue $\frac{1}{3}$ and 4 li. more, I demaunde howe much eache of them shall haue? Answere: Fyrste from 100 abate 5 and 4, which are 9 so there will remaine 91, then take the $\frac{1}{2}$ of 100 li. which is 50 li. for the first mans laying in. Likewise, take $\frac{1}{3}$ of 100 li. for the second mans laying in, which is 33 li. $\frac{1}{3}$. Then adde 50 li. and 33 li. $\frac{1}{3}$ togeather, and you shall haue 83 li. $\frac{1}{3}$ for your common diuisor, then multiply 91 pounde by 50, and diuide by

by 83 $\frac{1}{3}$, and thereof commeth 54 li. $\frac{3}{5}$, vnto the which number adde 5, and all is 58 li. $\frac{1}{5}$ for the first mans part of the gayne. Likewise multiplye 91 by 33 $\frac{1}{3}$, and diuide by 83 $\frac{1}{3}$, and you shal finde 36 li. $\frac{2}{5}$, vnto the whiche adde 4, and you shall haue 40 li. $\frac{2}{5}$, for the second mans part.

12 Two marchauntes haue gayned 100 li. the first must haue the $\frac{1}{2}$ lesse by 4 li. the seconde muste haue $\frac{1}{3}$ lesse by two li. I demaunde how much eche of them shall haue? Answere, Ad 4 & 2 with 100, & they make 106. Thē take as before is sayd, 50 li. for the first man & 33 $\frac{1}{3}$ for the seconde & ad them both together, & they be 83 $\frac{1}{3}$, which shall be your diuisor. Then multiply 106 by 50, & diuide the producte by 83 $\frac{1}{3}$, so thereof commeth 63 li. $\frac{3}{5}$. From the which abate the 4 li. lesse, that the first man taketh, & then is there remayning 59 li. $\frac{3}{5}$ for his part. Likewise multiplye 106 by 33 $\frac{1}{3}$, & diuide by 83 $\frac{1}{3}$, and

and you shall finde 43 li. $\frac{2}{3}$, from the whiche abate 2 li. lesse, and there remayneth 40 li. $\frac{2}{3}$ for the seconde mans parte.

The Rule of Felowship with time.

The money that euerye man layeth in, must be multiplyed by the tyme that it continueth in companye: and of that which cometh thereof, you shall make their new layings in for eache of them: and then multiply the gaynes by euery one of them seuerally, and the of comes you shall diuide by all theire newe layings in, added together, and then you shall haue proportionallye, eche mans part of the gayne according to his laying in.

Example.

1. Two marchants haue companied together, the first hath put in the firste of Januarie 450 pounde, the seconde did lay in the 2 of Maye 750 pounde. And

And at the yeres ende they had gained 100 li. I demaunde how muche eache of thẽ shall haue of the gayn? *Answere*, for as much as the first did put 450 li. the first of Januarie, his money continued in company 12 monthes, & therefore multiplie 450 by 12 months, and thereof commeth 5400, for his newe laying in. And the seconde laide in his 750 li. but at the first day of Maye: so that his money remaineth in company but 8 mõths. Therefore multiplye his 750 li. by 8, & thereof commeth 6000, for his new laying in: Then ad 5400 with 6000, and they make 11400 for your common diuisor: Then multiply 100 li. which is the gaines by 5400: & diuide the product by 11400, and thereof will come 48 li. $\frac{7}{19}$ for the first mans part of the gayne. Likewise multiplye 100 by 6000, and diuide the producte by 1140, and you shall find 52 $\frac{12}{19}$, and so much must the seconde man haue for his part of the gayne.

2 Two marchaunts haue companied togecher, the firste hath layde in the

firste

firste of Januarie 640 li. The seconde can laye in nothing untill the firste of Aprill. I demaund how much hee shall then lay in, to the ende that hee maye take halfe the gaynes? *Answere*, Multiplye 640 li. by 12 monthes, that his money abideth in company, and thereof will come 7680 li. for his laying in. And so much ought the seconde man to lay in, for because hee taketh $\frac{1}{2}$ of the gayne. But for that, that he putteth in nothing untill the firste of Aprill, his money can bee in companye no longer then 9 moneths. And therefore divide 7680 by 9, and thereof will come 853 li. $\frac{1}{3}$. So much ought the second marchant to lay in the first of Aprill, to the ende that he may take the one halfe of the gaynes.

3 Three Marchaunts haue companied together, the first layde in the first of Marche 100 li. The seconde layd in the first of June so muche money, that of the gayne he must haue the $\frac{1}{3}$ parte: and the thirde layde in the firste of Nouem-

ember so muche money, that of the gaynes he must haue likewise $\frac{1}{3}$, & they continued in companie, vntill the next Marche following. I demaunde howe much the seconde and the third Marchants did lay in. Answere: Multiply 100 li. which the first man did lay in, by 12 monethes, that his money continued in company, and thereof commeth 1200 for his laying in, and so muche ought the second and the thirde Marchantes each of them to lay in, bicause they part the gaines by thirdes. But by that, that the seconde Marchaunt layeth in nothing till the first of Iune his money can be in companye but 9 monethes. Therefore diuide 1200, by 9 monethes, and thereof will come 133 $\frac{1}{3}$. And so muche oughte the seconde Marchant to lay in. Then, for asmuch as the third Marchant did lay in nothing vntill the first of Nouember, his money abideth in company but the space of 4 monthes. Therefore diuide 1200 by 4, and thereof commeth 300 li. And so much ought the third Marchant

chant to lay into company.

4. Three Marchants haue compa-
nied together, the first laide in, the first
of January 100 Duckets. The second
hath laide in 50 li. the first of March,
and the third put in a Jewell the first
of July, and at the yeeres ende, they
had gained 400 crownes: of ye which,
the firste Marchante muste haue 50
crownes, and the seconde must haue
80. I demaunde what the Ducket
was worth, and at what price the Je-
well was valued, which the third
Merchant laide in? Answere, the first
mans money being 100 Duckets
multiplyed by 12 is 1200 Duckets
by the rule aforesaide, and hee taketh
50 crownes of the gaine: therefore
say, if 50 crownes gaine be come of
1200, which was his stocke, of how
much shall come 80 crownes gaine,
that the second man taketh? multiply
and diuide, and you shall finde 1920
for the seconde Merchants laying in.
Then say againe, if 50 crownes be
come

come of 1200 stocke, of howe muche shall come 270 crownes, whiche the thirde man taketh of the gaine: multiplie and diuide, and you shall finde 6480, for the thirde marchants laying in. Then diuide 1920, which is the second mans laying in, by 10 monethes that his money did continue in company, and you shall find 192 Duckets, whiche are worthe 50 li. bycause hee layed in 50 li. Then diuide 50 li. (being first reduced into shillinges by the diuide 192 Duckets) and thereof will come 5 shillings 2 pence $\frac{1}{2}$. So much was the Ducket worth: Finally, diuide 6480, (which is the thirde mans laying in) by 6 monethes that his Jewell remained in company, and you shall finde 1080 Ducketes, and for that price was the Jewel put into companie.

Three Merchants haue companied together: The first laide in the first of Januarie 100 li. and the firste of April, he hath taken backe againe 20 li.

The seconde hath laide in the firste of Marche 60 li. and afterwarde hee did lay in more 100 li. the first of August. The third laid in the first of July, 150 li. And the first of October he did take backe againe 50 li. And at the yeares ende, they founde that they had gained 160 li. I demaunde howe much euery man shall haue of the gaine ? Answere. Multiply 100 li. which the first man laide in by 12 monethes, and thereof commeth 1200 li. from that number abate 9 times 20 li. which are 180 for that which he did take backe againe: and there wil remain 1020 li, for the first mans laying in. Then multiply 60. which the seconde man laide in by 10, and you shall haue 600 : vnto the which adde 5 times 100 li. for ỹ money hee laide in more the firste of August, which are 500, so al amoūteth to 1100 for the second mans laying in ? Afterwardes multiply 150 pounde, which the thirde man hath laide in, by 6 monethes, and therof commeth 900, from the which number abate 3 times 50, they

they are 150 for the money that he did take backe agayne the first of October so there will remaine 750 for the third mans laying in. Then proceede with the rest, as is taught in the first question of the rule of Fellowship with time, in adding 1020, 1100, and 750 altogether: which shall be your diuisor. Then multiply 160 li. which is the gayne by 1020, 1100, and by 750: and diuide at euery time by your diuisor, that is to say, by all their layings in, added together, which is 2870: so you shall finde $56\frac{248}{287}$, for the first man: $61\frac{93}{287}$, for the seconde: and $41\frac{233}{287}$ for the thirde man.

6. Two Marchants haue companied together, the first hath laide in 960 Li. for the space of 12 months, & he oughte to haue 8 pound vpon the 100 pounde of the gaine. The seconde hath layde in 1120 pounde, for the space of 8 moneths, and he oughte to haue after 12 pounde vppon the 100 pounde of the gaine.

And at the yeares ende they haue gained 800 li I demaunde howe much each of them shall haue of the gaine? *Answere*: multiply 960 that the firste man did lay in by 12 monthes, and the product thereof multiplye agayn by 8, and you shal haue 92160 that the first mans laying in, then multiply ẏ 1120 that the second hath layd in, by 8 monethes, and that which commeth thereof, you shall multiply againe by 12, & you shall finde 107520, for the seconde mans laying in, then procede wyth the rest, as in the firste question of the rule of Fellowship is declared, and as in the last Exãple I haue taughte you, and you shall finde 369 Li. $\frac{3}{13}$ for the first man; and 430 Li $\frac{10}{13}$ for the second man.

The rule of companie, betweene *Merchantes, and their Factors.*

7. NOte that the estimation of the body or person of a Factor, is in

in such proportion to the stocke which the marchant layeth in, as ẏ gain of the sayd Factor is unto the gayne of the marchaunt. As thus, if a marchaunt do deliuer into the handes of his Factor 200 li. to imploye, and he to haue half the profite, the person of the sayd Factor shall be esteemed to bee worth 200 li. And if the Factor doe take but the $\frac{1}{3}$ of the gayne, he should haue but $\frac{1}{2}$ so much of the gayne as the marchaunte taketh which must haue $\frac{2}{3}$, wherfore ẏ person of the Factor is esteemed but the $\frac{1}{2}$ of that which the marchant layeth in, that is to say 100 li.

And if the Factor did take the $\frac{2}{5}$ of the gayne, then the marchant shal take the residue which are $\frac{3}{5}$ of the gaine: wherefore ẏ gayne of the Marchant unto that of ẏ Factor, is in suche proportion as 3 unto 2. Then if you will know the estimation of the person of the Factor, say if 3 giue mee 2 what will 200 giue? Multiplye 200 by 2, and diuide by 3, so you shal finde 133 $\frac{1}{3}$. Or otherwise, you must consi-

der

uer that the Factor taketh the $\frac{2}{3}$ of that which the Marchant taketh. And therfore take the $\frac{2}{3}$ of 200, and you shall finde 133 $\frac{1}{3}$, as before, and so much is the person of the Factor esteemed to be worth.

8. And if the marchaunt shoulde deliuer vnto his factor 200 li. and the factor would laye in 40 li. and his person, to the end he might haue the half of the gayne: I demaund for how much shall his person bee esteemed? *Answere*, abate 40 li. from 200 li. and there will remayne 160 li. And at so muche shall his person be esteemed.

And if the Factor woulde take the $\frac{2}{3}$ of the gayne, his person with his 40 pound, shall be esteemed twise as much as the stock that the Marchant layeth in, which should haue but $\frac{1}{3}$ of ÿ gayne for $\frac{2}{3}$ vnto $\frac{1}{3}$ is in double proportion. Therefore double 200 pounde, and thereof commeth 400 li. frõ the which abate 40 li. & there will remayne 360 li. But if the Factor woulde take onlye

ly the $\frac{2}{3}$ of the gaine, that shall bee but the $\frac{1}{2}$ of $\frac{2}{3}$ which the marchante taketh: and then the estimation of his person with his laying in should be esteemed but the halfe of that which the merchāt layeth in: you must therefore take the $\frac{1}{2}$ of 200 li. which is 100 li. from the which you shall abate 40 pounde, and the rest, which is 60 li. the estimation of his person.

9. If it so chaunce for to make traffickes of 240 li. that the person of the factor should be in such wise esteemed, that hee shoulde haue but the $\frac{1}{4}$ of the gaine, and yet he woulde haue the $\frac{2}{3}$, I demaunde how muche ready money he ought to lay in, besides his person: *Answere:* Seeing that his person gaineth the $\frac{1}{4}$, therefore all ẏ whole laying in, which is 240 li, shall gaine ẏ rest, that is to say ẏ $\frac{3}{4}$: now for because $\frac{1}{4}$, is ẏ $\frac{1}{3}$ of $\frac{3}{4}$ therefore his person shall bee esteemed the $\frac{1}{3}$ of all the layinge in. Take then ẏ $\frac{1}{3}$ of 240 li. and you shall haue 80 li. for the estimation of

his person, and for because that hee will haue halfe of the gayne, you shall adde 80 li. with 240 li, and therof commeth 320 li. of the which take ỹ halfe, which is 160 li. and from the same you shall abate the 80 li. & there will remain other 80 li. which he ought to lay in of ready money, and ỹ marchant must lay in the ouerplus, whiche amounteth to 160 li.

10 A marchaunt hath deliuered to his Factor 1200 li. to gouerne them in the trade of marchandise, vpon such condition, that hee for his seruice shall haue the $\frac{1}{3}$ of the gayne, if anye thing be gayned, and hee shall beare the $\frac{1}{3}$ of the losse, if any thing bee loste: I demaund for howe muche his person was esteemed? Aunswere, seeing that the Factor taketh the $\frac{1}{3}$ of the gayne, his person ought to be esteemed as muche as one halfe of the stocke whiche the Marchant layeth in, that is to say, the $\frac{1}{2}$ of 1200 li. which is 600 li. The reason is, for because the $\frac{1}{3}$ of the gayn that

that the Factor taketh, is the $\frac{1}{2}$ of the $\frac{2}{3}$ of the gaine that the marchant taketh. And so the Factor his person is esteemed to be worth 600 li.

11. A marchant hath deliuered vnto his Factor 1200 li. and the Factor layeth 500 li. & his person. Now, because he layeth in 500 li. and his person, it is agreede betweene them, that he shall take the $\frac{2}{5}$ of the gaine: I demaund, for how much his person was esteemed? *Answer*, Forasmuch as the Factor taketh the $\frac{2}{5}$ of the gaine, he taketh the $\frac{2}{3}$ of that which the marchant taketh, for $\frac{2}{5}$ are the $\frac{2}{3}$ of $\frac{3}{5}$: and therefore the Factors laying in, ought to be 800 li. which is the $\frac{2}{3}$ of 1200 li. that the marchant laid in. Then abate 500 li. which the Factor did lay in, from 800 li. which should be his whole stocke, and there remaineth 300 li. for the estimation of his person.

12. More, a marchant hath deliuered vnto his Factor 1000 li. vppon

such

such condition, that the Factor for his paines and seruice, shall haue ẏ gaines of 200 li. as though he layd in so much ready money: I demaunde what portion of gaine the said Factor shall take? Answere, See what parte the 200 li. (which the Factor laide in) is of 1200, which is the whole stocke of their company, and you shall find that it is the $\frac{1}{6}$, and such part of the gaine shal the Factor take.

But in case, that in making their couenants, it were agreede betweene them, that the Factor should haue the gaine of 200 li. of the whole stocke, which the marchant layeth in, that is to say, of the 1000 li. Then should the Factor take the $\frac{1}{5}$ of the gaine: for 200 li. is the $\frac{1}{5}$ of a 1000 li.

The xi Chapter treateth of the Rules of *Barter: that is to say to change Ware for Ware. &c.*

1 TWo Marchantes will change their Marchandise, ẏ one with the

the other, the one of them hath cloth of 7 s. 1 pence the yarde, to sell for readie money, but in barter he will sell it for 8 s. 4 d. The other hath Sinamon of 4 s. 7 d. the pound to sell for ready money, I demaund how he shall sell it in barter that he be no loser. Answere, say if 7 $\frac{1}{12}$: (whiche is the price that the yarde of cloth is worth in readie mony) be solde in barter for 8 $\frac{1}{3}$, for what shall 4 $\frac{7}{12}$, be solde in barter, whiche 4 $\frac{7}{12}$ is the price that the poūd of Synamon is worth in readie money; reduce ẏ whole numbers into their broken; and then multiply and diuide and you shall finde 5 s 4 d. $\frac{12}{17}$ partes of a peny, and for so much shall he sell the pounde of Synamon in Barter.

2. Two marchants will barter their marchandise the one with the other, the one of them hath Chamlets, of 2 pound 18 s. 5 d. the peece, to sell for ready money, and in barter he will sell the peece for 4 li. 3 s. 4 d. the other hath fine caps of 35 s. 10 pence the dosen, to sel in barter

ker. I demaunde what the Dossen of cappes were worth in readye money? Ans. say if 4 li. 3 s. 4 d. which is ẏ ouer price of the peece of Chālet, be come of 2 li. 18 s. 4 d. which was the iust price of ẏ same, of what shall come 35 s. 10 d. which is the ouerprice of the dosen of caps? Multiplye and diuide, and you shall finde 25 s. 1 d. and so much are the dosen of caps in readie money.

3 Two Marchauntes will chaunge their Marchandise the one with the other: the one of them hath Fustians of 18 s. 4 d. the pece to sel for ready money, and in barter he will sell the peece for 26 s. 8 d. The other hath tapistrie of 15 d. the elle, to sell for readie money and in barter he will sel it for 20 d. the elle, I demaunde which of them gaineth, and how much vpon the 100 li. of money? Answere; say if 18 s. $\frac{1}{3}$ which is the iust price of the peece of Fustiā) be solde in barter for 26 s. $\frac{2}{3}$: for howe much shall 1 s. $\frac{1}{4}$, whiche is the iuste price of the elle of tapistrie (be sold in bar-

barter ; multiplye and diuide, and you shall finde 21 d. $\frac{9}{11}$. And he doeth ouersell it but for 20 d. so that of 21 d. $\frac{9}{11}$ he maketh but 20 d. and therefore say by the rule of three, if the seconde Marchant of 21 $\frac{9}{11}$, doe make but $\frac{20}{1}$, howe much shall he loose in the $\frac{100}{1}$? Multiply and diuide, & you shall find 91 $\frac{2}{3}$ the which being abated from 100, there will remayne 8 $\frac{1}{3}$. And after the rate of 8 $\frac{1}{3}$ doth the second marchant lose in the 100. And consequentlye the firste marchant of 20 d. maketh 21 d. $\frac{9}{11}$, and therefore say agayne by the rule of 3 if the first marchant of $\frac{20}{1}$, doe make 21, $\frac{9}{11}$, how much shall he gaine vppon $\frac{100}{1}$ Multiplye and diuide, and you shall finde 109 Li. $\frac{1}{11}$. And thus the first marchant gaineth after the rate of 9 li. $\frac{1}{11}$ vpon the 100 li. of money.

For your better vnderstanding of these questions, you must note that when one marchant gayneth of an other, after the rate of 10 li. vppon the 100 li. he gayneth the $\frac{1}{10}$ of his owne principall, and the other whiche loseth after

after the rate of 9 $\frac{1}{11}$ in the 100 li. hee loseth the $\frac{1}{11}$ of his principall. And it may be proued thus: when one Marchāt will sell his wares vnto another, whiche wares stande him but in 100 li. and he will sell them for 110 pound therefore he of his 100 li. maketh 110 li, and so he gayneth after 10 li. vppon the 100, which is the $\frac{1}{10}$ of his principall, and the other which buieth wares for 110 li. ŷ cost the other but 100 li. of the 110 li. he maketh but 100 li. And therefore say by the rule of 3, if 110 be come of 100, of how much shall come 100? Multiplie & diuide, and you shall finde 90 $\frac{10}{11}$, the which abate from 100 and there will remaine 9 $\frac{1}{11}$, which is the $\frac{1}{11}$ of the principall, that the second loseth in the 100 li. as afore is sayd. And therefore who so that will knowe what one marchaunt gayneth of another, either after the rate of 10 pound vppon the 100 li, which is the $\frac{1}{10}$ of his principall, or else after the rate of 20 li. vpon the 100 pound, which is the $\frac{1}{5}$ or of any other parte, and that he would

like-

likewise knowe what parte the other looseth of his principall: he must take for the numerator of the broken number of him that loseth, as much as for him that gaineth, then adde the numerator and the denominator (of the broken number of him that gaineth) both togeather, and make thereof the denominator of the broken number of him that loseth, and then shall you haue the iust parte of him that loseth: as by example, of him that gaineth after 10 li. vppon the 100 li. which is the $\frac{1}{10}$ of his principall: take the numerator of $\frac{1}{10}$ which is 1, and make that the numerator of the broken number of him that loseth, then adde 1, which is the numerator of the Fraction of him that gaineth, with 10, which is his denominator, and you shall haue 11 for the denominator of the Fraction of him that loseth. Then put 1 ouer the 11, and so you shall haue $\frac{1}{11}$. Thus it appeareth when one Marchant gaineth of another after 10 li. vpon the 100 li. he gaineth the $\frac{1}{10}$ of his principall, and the

other

other looſeth 9 $\frac{1}{11}$, which is the $\frac{1}{11}$ of his principall. And if he woulde gaine after 20, vpon the 100 li. which is the $\frac{1}{5}$ of his principall, the other ſhould loſe 16 $\frac{2}{3}$. which is the $\frac{1}{6}$ of his principall & ſo is to bee vnderſtande of all other fractions.

4. Two Marchantes will chaunge their marchandiſe the one with the other, the one of them hath Sayes of 20 s. and 10 d. the peece to ſell for readie money, and in barter hee will ſell the peece for 23 s. 4 d. and yet hee will gayne moreouer, after 10 pounde vpon the 100 pounde. The other hath woll of 50 s. the 100 waight to ſell for readie money. I demaunde how he ſhall ſell C of woll in barter? *Anſwer*: ſay if 20 s. 10 d. which is the iuſt price of the peece of Saie, be ſolde in barter for 23 s. 4 d. for howe much ſhall 50 ſhil. (which is the iuſt price of the C. of woll) be ſolde in barter? multiply and diuide and you ſhall finde 56 s. Then for bicauſe the firſt marchant wil gaine after

after 10 li. vpon the 100 li? he maketh of his 100 li. 110 so the seconde Marchant maketh of 110 li. but 100 li. And therefore say by the rule of 3, if the second marchant of 110, doe make but 100, howe much shall he make of 56? Multiply and diuide and you shall find 50 s. 10 d. $\frac{10}{11}$ of a peny, and for so much shall he sell the hundred of woll in barter.

5. More, two marchants will change their marchandise, the one with the other; the one of them hath taffeta, of 16 crownes the peece, to sell for ready money; and in barter hee will sell the peece for 20 crownes, and yet he will gaine moreouer after the rate of 10 li. vpon the 100 pound. The other hath Ginger of 3 s. 9 d. the pound waight, to sell in barter. I demaund what the pounde did cost in ready money. *Ans.* say if 20 crowns which is the surprice of the peece of Taffeta be come of 16 crownes the iust price, of howe muche shall come 3 s. 9 d. which is the surprice

of the pounde of Ginger ? Multiply and diuide, and you shall finde 3 shil. Then, for bycause that the Marchant of Taffeta will gaine after the rate of 10 vppon the 100: say if 100 doe giue 110: what will 3 s. giue ? multiply & diuide, and you shall find 3 s. 3 d. $\frac{3}{5}$ and so much did the pounde of Ginger cost in ready money.

6. More, two Marchants will change their marchandise, the one with the other, the one of them hath Worsteds of 25 s. the peece, to sell for ready money and in barter he will sell the peece for 33 s. 4 d. and yet he loseth after 10 li. in the 100 li. the other hath ware of 3 li. 6 s. 8 d. the 100 waight to sell for ready money. I would knowe for what price he should sell his ware in barter. *Answer*: saye if 25 s. whiche is the iuste price of the peece of Worsteds, be solde in barter for 33 s. 4 d. for howe much shall 3 pounde 6 s. 8 d. be solde whiche is the iuste price of the 100 of ware, as it was worth in ready money,

ney. Multiplie & divide, and you shall finde 4 li. $\frac{4}{9}$ which is 88. 10 d $\frac{2}{3}$, then for because that the marchaunte of worsteds, loseth after 10 li. in the 100 li. of 100 li. he maketh but 90. & therefore say, if 90 give 100, what giveth 4 pounde $\frac{4}{9}$? Multiply and divide & you shall finde 4 li. $\frac{76}{81}$, which is worth 18 s. 9 pence $\frac{5}{27}$, and for so much shall he sell the 100 pounde waight of ware in barter.

7. More, two Marchaunts will change their marchaundise the one with the other, the one of them hath worsteds of 5 li. 6 s. 8 d. the peece to sel for readye money, and in barter he will sell the peece for 6 pounde 13 s. 4 pence & yet he loseth after 10 li. in the 100: and the other hath maske of 2 shil. 9 d. the pounde waight to sell in barter. I demaunde what the pounde did coste in ready money? *Answere*, say if 6 li. $\frac{2}{3}$, which is the over price of the peece of worsted, be come of 5 li. $\frac{1}{3}$, which is the price of the same, of howe muche

shall come 2 s. 9 d. $\frac{1}{3}$. Multiplye and diuide, & you shall find 2 s. $\frac{2}{9}$, whiche $\frac{1}{9}$ is 2 d. $\frac{2}{3}$: then for because that the marchant of Mo2ltevs loseth after 10 li. in the 100 li. of a 100 he maketh but 90, therefore say, if 100 giue but 90, how much shall 2 s. $\frac{2}{9}$ giue? Multiplye and diuide, and you shall finde 2 s. and so much cost the pound of muske in readye money.

¶ Other rules of Barter, wherein is giuen *some part in readie money.*

WHen a Marchaunt ouerselleth his marchaundise, and he will haue also some part of his ouerprice in readie money: as the $\frac{1}{2}$, the $\frac{1}{3}$, or the $\frac{1}{4}$ &c. He must subtract the same part of money from the iust price, and also from the ouer price of his marchaundise: and the two numbers that remaine after the subtraction is made, shall bee the two firste numbers in the rule of three: and the iust price of the seconde Marchant shall bee the thirde num-

number: to know how much hee shall ouersell the parte of his marchandise.

Example.

8. Two Marchauntes will chaunge their Marchandise the one with the other, the one of them hath fine wooll, at 5 li. the 100 li. waight to sell for readie money, and in barter he will sell it for 6 li. And yet hee will haue the $\frac{1}{3}$ in ready money. The other hath cloth of 13 s. 4 d. the yarde to sell for readye money. I would know howe hee shall sell the same in bar? *Answere,* take the $\frac{1}{3}$ of 6 li. which is ye ouerprice of ye 100 of wool, & that is 2 li. the whiche you must abate from 5 li. which is the iust price of 100 of wool, and also abate it from 6 li. which is the ouerprice, and there shal rest 3 li. and 4 li. for the two first numbers in the rule of three, then take 13 s. 4 d. whiche is the iust price of a yarde of cloth, for the thirde number: Then muliply and diuide, & you shall finde 17 s. 9 d. $\frac{1}{3}$: for so much shall

the second sell his cloth in barter.

9. More, two marchaunts wil change their marchandise the one with the other, the one of them hath ware of 3 li. 6 s. 8 d. the C. to sell for readie money, and in barter hee will sell the same for 4 li. 3 s. 4 d. and yet he will haue the ¼ in readye mony, and the other hath fiue C. crimson sattin of 15 shil. the yarde to sell in barter. I demaunde what it is worth in readie money. *Ans.* take the ¼ of 4 li. 3 s. 4 d. which is 1 li. 10 pence and abate it from 4 li. 3 s. 4 d. and also from 3 li. 6 s. 8 d. and there resteth 3 li. 2 s. 6 d. and 2 li. 5 s. 10 d. for the two first numbers in the rule of 3. And 15 shillinges for the third number, which 15 shillinges is the ouer price of ye yard of sattin, then multiply and diuide and you shall haue 11 shil. and so much doth the yarde of sattin coste in readye money.

10. Two marchauntes will change their marchandise the one with the other

ther

other, the one of them hath tinne of 50 s. ye 100 li. waight to sell for ready money, and in barter he will sell it for 3 li. 6 s. 8 d. and he will gaine after 10 li. vppon the 100. and yet he will haue also the one halfe in ready money. The other hath Leade of 3 halfepence the li. to sell for ready money. I demaunde how he shall sell the li. of Leade in barter? Answere. See first at 10 li. vpon the 100 li. what the 3 li. $\frac{1}{3}$, will come vnto, in saying by the Rule of three: if 100 giue 110, what will 3 $\frac{1}{3}$ giue: multiply and diuide, and you shall finde that they will come to 3 li $\frac{2}{3}$, whiche is 13 s. 4 d. of the which, the halfe which he demaundeth in ready money, is 36 s, and 8 d. the same being abated from 50 s. and also from 3 li. 12 s. 4 d. there will remaine 13 s. 4 d. and 1 li. 16 s. 8 d. for the two first numbers in the rule of three, which you must put all into halfepence, and the aforesaid three halfepence shall be the third number, and then multiply and diuide, and you shall finde 4 d. $\frac{1}{8}$, and for so muche shall

he sell the li. of leade in barter.

11 More, two Marchantes will change their marchandise the one with the other, the one of them hath steele of 16 s. 8 d. the 100 li. waight, to sell for ready money, and in barter hee will sell it for 25 s. and yet he loseth after 10 li. in the 100 li. but he will haue ÿ ½ in ready money: the other hath yron of 6 s. 8 d. the hundred to sell in barter. I demaund what ÿ hundred of yron did cost in ready money? *Aunswere.* say if 100 come but to 90, howe muche shall 25 s. come to? Multiply and diuide, and you shall find 22 s. 6 d. of the which maner, take the ½, which is 11 s. 3 d. and subtract it from 22 s. 6 d. and also from 16 s. 8 d: and there will remaine 11 s. 3 d: and 5 s. 5 d. for the two first numbers in the rule of three, and 6 s. 8 d. which in the ouerprice of a hundred of yron, for the third number, then multiply and diuide, and you shall finde 3 s. 2 d. $\frac{14}{27}$: and so much did the hundred of yron cost in ready mondy.

12. More, two marchants will change their marchandise the one with the other, the one of them hath Saies of 20 s. 10 d. the peece to sell for readie money, and in barter he will sell the peece for 25 s. and he will haue the ¼ in ready money, the other hath Caps of 35 shil. the dosen to sell for ready money, but he will gaine after the rate of 10 li. vppon the 100 li I demaunde howe he he shall sel the dosen of caps in barter?

Answere. say if 100 bee worth 110. What shall 35 s. be woorth, which is the iust price of the dosen of caps, multiply and diuide, and you shall finde 38 shil. 6 d. Then tak the ¼ of 25 s. which is 6 s. 3 d. and subtracte it from 20 s. 10 d. and also from 25 s. and there will remaine 14 s. 7 s. and 18 s. 9 d. for the two first numbers in the rule of three, and 38 s. 6 d. whiche is the iuste pryce with his gaine in the dosen of Cappes, for the thirde number, then multiplie and diuide, and you shall finde 49 shil. 6 d. and for so much he shall sell the dosen of caps in barter.

The

The 12. Chapter treateth of the *exchanging of money from one place to another.*

First you must note that at Antwerp they vse to make their accountes by Deniers de gros, that is to say by pence Flemish, wherof 12 doe make 1 s. Flemishe, and 20 s. Flemishe doe make 1 li. de gros.

Example.

1. If I deliuer in Flaunders 500 li. Flemishe, at 19 s. 6 d. de gros, that is to say at 19 s. 6 d. Flemishe, to receaue 20 s. at London, I demaund how much I shall receaue sterling at London, for the saide 500 li. Flemish? Answere: Say if 19 $\frac{1}{2}$ giue $\frac{20}{1}$, what will $\frac{500}{1}$ giue? Multiply and diuide, and you shall finde 512 li. 16 s. 4 d. $\frac{12}{13}$ of a peny. And so much sterling shall I receaue in London for my 500 li. Flemishe.

2.

2. If I deliuer in London 375 li. sterling, to receiue in Andwerpe 21 s. 9 d. the grosse, that is to say, Flemish, for euery pounde sterling. I demaund how many poundes flemishe I shall receiue in Andwerpe, for ye sayd 375 li. sterling? *Answere*, say if $\frac{1}{1}$ giue $21\frac{3}{4}$, what will $\frac{375}{1}$ giue? Multiply and diuide, and you shall finde 407 li. 16 s. 3 d. So many poundes flemishe shall I receiue in Andwerpe for the sayd 375 li. ster. in Andwerpe.

3. If I take vp money at Andwerpe, after 19 s. 6 d. Flemishe, to pay for the same at London 20 s. ster. and when the day of payment is come, I am forced to returne the same, and to take vp money agayne in London to pay my bill of exchange, so that for 20 s. which I take vp here, I must pay 19 shil. 9 d. at Andwerpe. I demaunde whether I doe winne or loose, and howe much in, or vpon the 100 li. of money? *Ans.* Say, if $19\frac{2}{4}$ giue $19\frac{3}{4}$, what will $\frac{100}{1}$ giue? multiply & diuide, and you shall

finde

finde 98 $\frac{59}{79}$, the whiche being abated from 100, there will remayne 1 $\frac{20}{79}$. And so much doe I lose vppon the 100 pound of money.

4. If I take vp at Londō 20 shillings sterling, to pay at Antwerpe 21 shil. 8 d. Flemishe, and when the day of payment is come, my Factor is constrayned to take vp money agayne at Antwerpe, wherewith to pay the foresayde summe: and there he doeth receiue 22 shil. Flemishe, for the whiche I must pay 20 shil. at London. Nowe I demaunde whether I doe winne or lose, and how much the 100 li. of money after the rate? *Answere*, saye if 21 $\frac{2}{3}$ giue $\frac{22}{1}$, what will $\frac{100}{1}$ giue? multiply and diuide, and you shall finde 101 $\frac{7}{13}$ from the which abate 100, and there will remayne 1 $\frac{7}{13}$: and so muche shall I gayne vppon the 100 pounde of money.

The exchaunge from London into Fraunce, is not like as it is into Flaunders, but is deliuered by the Frenche crowne

crowne, which is worth 50 souse tournois the peece.

And heere muste you note, that in Fraunce they make their accounte by Deniers Tournois, whereof 12 Deniers maketh 1 souse Tournois, and 20 souse Tournoise maketh 1 li. tournoise, which they call liure or Franc, and the frenche crowne is currāt amōg marchaunts, for 51 souse tournois, but by exchaunge it is otherwise, for they will deliuer but 50 souse Tournoise, which is 2 li. 10 souse Tournoise for a Crowne and at such price the crowne, as the taker vp of money cā agree with the deliuerer.

Example.

¶ If I deliuer 340 li. ster. heere in London, after 6 shil. 4 d. sterling the crowne, to receiue at Roan, or at Parrise 50 Souse Tournois for euerye Crowne, I woulde know how many Liures Tournoise I shall receyue there for my 340 pound ster. Answ. say if

if 6 s. $\frac{1}{3}$, ster. doe giue mee 2 li. $\frac{1}{2}$ Tournois, what wil $\frac{6800}{1}$ shil. giue (which is ye 340 li. reduced into shillinges, then multiply and diuide, & you shall finde 2684 Lieures, $\frac{4}{19}$, whiche is worth 4 souse $\frac{4}{19}$ Tournoise, and so muche shall I receiue in Roan or Parris for my 340 li. sterling.

6. If I deliuer in Parris or Roan, or else where in Fraunce 1250 Liures Tournoise, at 50 souse Tournoise the Crowne, to receiue for euery ye suche Crowne, 6 shil. 3 d. sterling at London. I demaunde how much sterling money I shall receiue at London for my 1250 pounde Tournoise? *Answere*, say, if 2 li. $\frac{1}{2}$, doe giue me 6 s. $\frac{1}{4}$, what will $\frac{1250}{1}$ giue? Multiply and diuide, & you shall finde 3125 shil. sterling, which maketh 156 pound 5 shil. sterling And so many poundes shall I receiue at London for the sayd 1250 Liures Tournois, after 6 shil. 3 pence for euery Crowne of 50 souse.

The

The 13, Chapter treateth of the *Rule of allegation or mixture.*

The Rule of Allegation is so named for that it teacheth to alligate or binde togeather diuers percels of sundry prices, and to know how much you muste take of euery percell according to the numbers of ẏ question, the which rule is distinct into two parts as followeth.

The first part of the rule of Alligation, sheweth how to make a mixture of diuers things being of sundry prices, and of ẏ same things so mixed, to know the common price of the said mixture.

Example.

1. A man woulde mixe 5 bushels of wheate at 2 s. 8 d. the Bushell with 9 bushels of Rye at 2 s. the bushell, and woulde know how muche the Bushell

so

so mixed doth stand him in, the one with the other, *Answere* : for to knowe the same common price. You must multiply every thing by his price, and adde all the productes together, the which you must diuide by the number of all the thinges that are to bee mixed, and the quotient will aunswere to the question, as in the aforesaide Example, I multiply 5 bushels by his price, that is to say, 2 s. 8 d. and thereof commeth 13 s. 4 d. Likewise I multiply 9 bushelles by 2 s, maketh 18 s. both these summes added together, doe make 31 s. 4 d. the which I doe reduce into pence, and they make 376 pence, then I diuide 376 by 14, which is the number of all the bushels, and my quotient will be 20 pence and $\frac{6}{7}$, and so much doth one bushell of both the sortes of graine stand him in.

2. If you haue two seuerall thinges whereof you would mixe equall portions together, you must adde their prices & take onely ½, if you would myxe

mixe togethers equall portions of 3 things, you must take $\frac{1}{3}$, and of 4 the $\frac{1}{4}$, and so continuing, as by example, wheate of 2 s. 8 d. the bushel, and Rie of 2 s the bushell, being mingled by equall portions, I adde 2 s. 8 d. and 2 s. togeather, and they make 4 s. 8 d. whereof the one $\frac{1}{2}$ is 2 s. 4 d. & so much is the valew of one bushell of suche a mixture. And if there were a portion of Barley at 20 d. then I must adde 2 s. 8 d. 2 s and 20 d. togeather, & they make 6 s. 4 d. whereof the $\frac{1}{3}$ whiche is 2 s. 1 d. $\frac{1}{3}$ should be the price of one bushell of that mixture.

3. A marchant hath 27 li. waighte of large Cloues at 6 s. the li. 15 li. of the middle sorte at 2 s. 6 d. the li. And 10 li. of Fusse at 2 s. 2 d. the li. When all the same are mixed togeather, I would knowe howe muche the li. is worthe? Answere: you muste multiply euery droog by his price, and then diuide the totall summe of the productes, by the whole waight of the droogs, and you

shall find 5 s. 1 d. $\frac{2}{26}$ and so much is the li. of that mixture worth.

27	at 6 s. 0 d.		162
15	at 2 s. 6 d.		$37\frac{1}{2}$.
10	at 2 s. 2 d.		$21\frac{2}{3}$.
52			$221\frac{1}{6}$

4. And if you woulde mixe $\frac{1}{2}$ large cloues, $\frac{1}{3}$ of middle, and $\frac{1}{4}$ of Fust, and you woulde knowe howe muche the pounde waight were worth, you must take a number, which conteineth those partes, as for example 12, whereof the $\frac{1}{2}$ which is 6 shall signifie so many li. of large cloues: The $\frac{1}{3}$ which is 4, shalbe so many li. of middle, and the $\frac{1}{4}$ which is 3, shalbe so many li. of Fust. Then afterwards you must multiply euery drug by his price, and diuide the total summe of the drugs, and you shall find 4 s. $\frac{1}{26}$. And so much is 1 li. waight of the mixture.

6.	at 6 s.	0 d.	36.
4.	at 2 s.	6 d.	10
3.	at 2 s.	2 d.	06 $\frac{1}{2}$.
13.			52 $\frac{1}{2}$.

5. And if you would make 100 pounde waighte of suche a mixture, you shall make by the rule of company, and you shall finde 46 li. $\frac{2}{13}$ of large cloues, 30 li. $\frac{10}{13}$ of middle, and 23 $\frac{1}{13}$ of Fust.

$$13.\quad 100 \begin{cases} 6^{li.}\ \textit{Ans.}\ 46\frac{2}{13}. \\ 4^{li.}\ \textit{Ans.}\ 30\frac{10}{13}. \\ 3^{li.}\ \textit{Ans.}\ 23\frac{1}{13}. \end{cases}$$

100

6. A Goldsmith hath 8 li. waight of siluer billion of 7 ounces fine, more 15 li. of 8 ounces $\frac{1}{2}$ fine, & 13 li. waighte of 10 ounces fine, and he will melt all these together, and make of them one masse. The question is to knowe of what finenesse the pound waighte is? Answere, you must multiplye the number of the waightes of euerye Billion, by his finenesse, & thereof wil come the

 ounces

ounces and partes of ounces fyne, the which you must add together, and they will make 313 ounces ½ of fyne, the same you must diuide by 36 whiche is the whole summe of the pound waight of Billion, and you shall finde 8 ounces and $\frac{1}{2}$ remayning, which $\frac{1}{2}$ partes of an ounce, is worth 14 penie waight, & 4 graynes, and so muche is the pound waight of this mixture worth.

8 lib.	at 7 onz.	is 56
15.	at 8 onz. ½.	is 127 ½.
13.	at 10 onz.	is 130
36.		313 ½

7. A Goldsmith hath three sortes of Siluer billion, that is to saye, 5 li. 7 ounces 10 peny waight, at 7 ounces fine. 12 li. 3 ounces, at 6 ounces ½ fine. And 4 li. at 9 ounces fyne, al the which he will melt into one masse. The question is to knowe, of what finenesse the pound waight of that mixture shal be? *Answere*: you must multiply euery billion by his finenes, as afore. And add together

together all the products, and they doe amount to 155 li. $\frac{17}{42}$. Then adde all the waights of the Billions together into one summe, and they make 21 li. $\frac{7}{9}$. diuide then 155 $\frac{17}{42}$ by 21 $\frac{7}{9}$, & your quotient 7 ounc. and $\frac{1876}{6400}$ remayning the which $\frac{1876}{6400}$ being brought into penie waights or graynes, doe gaine two penie waight, 10 grains, $\frac{2}{35}$ of a grain fyne. So you maye perceiue that the same mixture is of 7. ounc. 2 pence 10 graynes, and $\frac{2}{35}$ of a grayne fyne, the pound waight.

And here is to be noted that the reckoning of the waightes for Syluer is thus as followeth, that is to say.

1 li. of Troye waighte maketh 12 ounces.

1 Ounce is diuided in 20 pennies waight.

1 Penie waighte is distributed into 24 graynes.

1 grayne into 20 smaller partes. &c.

And the reckoning for Gold is thus,

1 Ounce of fine golde without any alloy, is imagined to be 24 karets.

1 Karet is diuided into 4 graynes.

1 Grayne is parted into two halfe graynes, or 5 quarters of a grayne, &c. And so into other smaller parts.

8. But if the sayd Goldsmith would put 5 li. waighte of Copper with the sayd Billions, and you woulde know of what finenesse it is, then must you adde the same 5 li. with the 21 li. $\frac{7}{8}$, and it maketh 26 $\frac{7}{8}$. Then diuide the aforesayd 155 li. $\frac{17}{432}$, by 26 li. $\frac{7}{8}$, and you shall finde 5 ounces fine, and $\frac{8216}{10320}$ remayning, the which $\frac{8216}{10320}$ is worth 15 penie waight, 22 graynes, and $\frac{11}{43}$. And of that finesse will the same masse be.

9. A Goldsmith hath melted 12 li. waight, and 5 Ounces of Golde billion, being of 18 karets fine, with 4 pound waight, 4 ounces and $\frac{1}{2}$, at 21 karets fine, I demaund of what finenesse is 1 li. waight of the same masse. *Ans.*

you

you must multiply the waightes (by the karets fine) of eache sort, & adde the products togeather, the same you must diuide by the whole summe of all the waightes added togeather, and youre quotient will shew you of what finesse the same is of, as in the former example, I doe multiply 12 li. & 5 ounces by 18 karets, and thereof commeth 223 karets $\frac{1}{2}$. Likewise I doe multiply 4 li. waight, 4 ounces $\frac{1}{2}$, by 21 karets and thereof commeth 91 karettes $\frac{7}{8}$ these two summes of karettes I doe adde togeather, and they make 315 karettes $\frac{3}{8}$. Then I do adde 12 li. waight 5 ounc. and 4 li. waight, 4 ounces and $\frac{1}{2}$ togeather, & they make 16 li. 9 ounc. $\frac{1}{2}$, the which 9 ounces $\frac{1}{2}$ are $\frac{19}{24}$ partes of a pound: and therfore I diuide 315 $\frac{3}{8}$ by 16 li. $\frac{19}{24}$, and thereof commeth 18 karets and $\frac{2520}{3224}$ remaining, which fraction is 3 graines, and $\frac{51}{403}$ partes of a graine. And of that finesse is 1 li. waight of the saide masse.

A Goldesmith hath melted 10 li. waight, 7 ounces and $\frac{3}{8}$ of 20 karettes.

and $\frac{1}{3}$ fine. And 8 Li. waight, 2 ounces and $\frac{5}{8}$ partes of 23 karets fine, with 15 Li. waight, 1 ounce of Siluer. The question is of what finesse is the pound waight of the saide masse? *Answere:* you must multiply the waight of euery sorte of Golde billion by his alloy, that is to say by his finesse, and adde al the producces togeather, and you shal finde 340 karets $\frac{25}{432}$, then adde the waight of the two sortes of Golde billion, with the waight of the Siluer togeathers, and thereof will come 33 Li. 11 ounces $\frac{5}{24}$, the which 11 ounces $\frac{5}{24}$ is $\frac{269}{288}$ of a pounde waight, then diuide the saide 340 karets, $\frac{25}{432}$ partes, by 33 poundes $\frac{269}{288}$, and you shall find 10 karets $\frac{4205}{203871}$. And of the same finesse shall the pound waighte of that masse of Golde be.

The seconde part of the rule of Alligation.

1. A Goldsmith hath 4 sortes of Gold. The firste is worth 30 crownes the pound waight, the second is worth 36 crownes

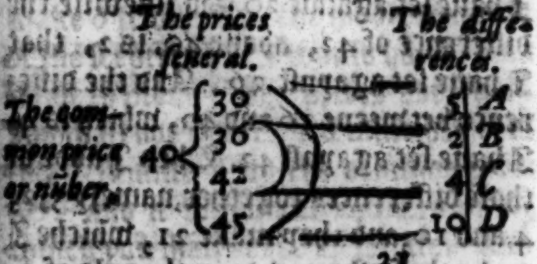
crownes, and the thirde is worth 42 crownes, and the fourth is worth 45 crownes, and of their 4 sortes he will make a Scepter of 6 pounde waight, which shall be worth 40 crownes the pounde. I demaunde howe muche hee muste take of euery sort. *Answere*, first you must set downe the numbers wher of you will make the alligation (which are 30, 36, 42, and 45, orderly the one vnder the other, after the same manner, as if you woulde adde them togeather: and the common number whereunto you will reduce them, you shall set on the left hand, which common number in this Example is 40. Then marke which of the saide foure numbers, are lesser then that common number, and which of them be greater, and with a drought of your pen, euermore linke two numbers together, so that the one be lesser then that common number, & the other greater then it, for two greater, nor two smaller numbers maye not be linked togeather, for they will either be lesser, or else greater then the

com-

commō number: but one greater nū-
ber, and one smaller may be so mixed
that they will make the common nū-
ber. And two greater or two smaller
numbers, can neuer make the commō
number in due order, as hereafter
shall appeare.

After ẏ you haue thus linked them,
then marke howe muche eache of the
lesser numbers is smaller than ẏ com-
mon number, and that difference you
shall set against the greater numbers
which be linked with those smaller,
eache of them with his matche still on
ẏ right hand. And likewise you must
set the excesse of the greater numbers
against the lesser which be combined
with them. Then shall you adde all
those differences into one summe,
which shall be the first number in the
rule of three, and the seconde number
shall be the whole masse peece ẏ you
will haue of all the perticulers, which
in this example was presupposed to
be 6li. Then the third summe shall be
each difference by it selfe, and by them
shall

shall you find out the fourth number, declaring the iust portion that you shal take of euerye particular in that mixture, as now by the former example, I will make it more playne.



21. 6. 5. | | 21. 6. 2.

21. 6. 4. | | 21. 6. 10.

Here in this former example, you see that I haue set downe the seuerall prices, which be 30, 36, 42, 45, and haue linked together 30 with 45, and 36, with 42. The common price 40, I haue sette on the left side as before is declared, and the difference of it frō

euerye

euery seuerall price. I haue set on the right hande againste that summe with the which it is linked. So the difference of 30 from 40 is 10, which I set against 35 that he is linked withall, & the differēce of 45 aboue 40, is 5, which I haue set against 30. So likewise, the difference of 42, aboue 40, is 2, that I haue set agaynst 36. And the difference betweene 36 and 40, which is 4, I haue set agaynst 42. Then I adde al those differences together, namely 5, 2, 4, and 10, and they make 21, whiche I make the first number in the rule of 3, and 6 pounde which is the waighte of the Scepter of Gold the seconde number, and the third number shall bee euery particular difference for euery seuerall working. Then worke by the rule of three, saying, if 21 (which is all the differences added together) do giue me 6 li. waight, which is the waighte of the Scepter, what shal 5 giue, which is the first difference?

I multiply and diuide, and I find 1 li.

li. waight $\frac{3}{7}$, so much must I haue of ẏ first price then I do in like maner with the rest, and I finde $\frac{4}{7}$ of a li. waighte of the second price, 1 li. $\frac{5}{7}$ of the third price and 2 li. $\frac{4}{7}$ of the fourth, the whiche 4 summes being added together, doe make 6 li. which is the whole waighte of the scepter that I would haue, and nowe to proue if the prices doe agree you shall doe thus: First multiply this totall summe 6 by the common price 40, and it will make 240 Crownes, which you shall keepe by it selfe. And afterwarde multiplye euerye seuerall summe of waighte by the price belonging to the same waighte, and if that summe do agree with the first that you keepe by it self, then is your worke wel done, as here 1 li. $\frac{3}{7}$, is the waight of ẏ sort of Golde which is of 30 Crownes price: Therefore multiply 30 by 1 li. $\frac{3}{7}$, and it maketh 40 crownes $\frac{6}{7}$, whiche you must set downe. Then multiplye $\frac{4}{7}$ (which is the waighte of the seconde sorte of Golde) by 36, whiche is the price of the same, and thereof commeth

20

20 crownes $\frac{4}{7}$; so agayne 1 li. $\frac{1}{7}$, multiplyed by 42 crownes, whiche is the thirde price, doeth make 48 Crownes. And last of all 2 li. $\frac{6}{7}$, multiplied by 45 maketh 128 crownes $\frac{4}{7}$. All these being added together, doe make 240 crownes agreeable to the former sum of 40, multiplied by 6, and thus I maye affyrme that his worke is well done.

2. A Tauerner hath foure sortes of wine, of foure seuerall prices, the firste of 8 pence the Gallonde, the seconde of 10 pence the Gallonde, the third of 15 pence, and the fourth of 18 pence; and he will mixe all these sortes together, so that the gallonde shall be worth but 12 pence. I demaunde how many gallons hee must take of euery sort. Ans. first suppose the punchen to holde some certayne measure, as to contayne 84 gallonds, and then the forme will be after this sorte, as you see hereafter following.

12	8	3
	10	6
	15	4
	18	2
		15

If 15 doe giue 84.

What will 3.	giue? They make	$16\frac{4}{5}$ of the first.
What will 6.		$33\frac{3}{5}$ of the second.
What will 4.		$22\frac{2}{5}$ of the thirde.
What will 2.		$11\frac{1}{5}$ of the fourth.
		84

3 A mint master hath 4 sortes of silver Billion, of these finesse following. The first is of 3 ounces fine, the second of 5 ounces fine, the thirde of 8 ounces fine, and the fourth of 10 ounces fine. And of all these 4 sortes, he would make another sorte, that should be but of 6 oun. fine The question is to knowe what portion he must take of euery of the said billions? Answere: Set downe the particular finesse, the one vnder the other, namely 3, 5, 8, and 10, and set a

which

which is the cõmon finesse, before them toward your lefte hande, as heere you may see.

Then put the difference of 3 from 6, right against 10, and the difference of 6 from 10, which is 4 right against 3: Likewise the differẽce of 5 frõ 6, which is 1, right against 8: and the difference of 6 from 8, which is 2, right against 5. This done, you shall conclude, that for euery 4 pounde waight that hee taketh of the billion of 3 ounces fine, hee must take 5 li. of the billion of 5 ounces fine, and 1 li. waight of the billion of 8 ounces fine, and 3 li. waight of that which is of 10 ounces fine. Or else if you please, adde 4, 2, 1, and 3, togeather and they make 10, which shall bee the denominator, of euery of the portions

that

that is to say, you shall take $\frac{4}{10}$ of the billion of 3 ounces fine, $\frac{2}{10}$ of that which is of 5 ounces fine, $\frac{1}{10}$ of that of 8 ounces fine, and $\frac{3}{10}$ of that which is of 10 ounces fine, and so of all such like: And if you would make 60 li. waight of such a mixture, you must adde 4, 2, 1, and 3 togeather, which maketh 10, and then worke by the rule of three, saying, if 10 li. giue 60 li. what will 4 giue? and so likewise what will 2 giue &c. This forme may be varied, by combining the particular valewes after this maner, as heere you doe see, and as in the other example is plaine.

Sometimes the valew doth change his difference, and is linked unto others for to represent the portion that is to bee taken of every thing, as by ex-

ample. A marchât hath wheat of 2 s. 8 d. the bushell, Rye of 2 s. and barley of 16 d. the bushell, and hee will make a mixture of these sorts which shall stand him but in 22 pence the bushell. It is demaunded howe muche hee may take of euery sorte of the sayd grayne? *Ans.* Put the differences of 22 from 32 and 24 right agaynst the 16. And likewise the difference of 16 from 22 right agaynst 32 and agaynst 24, and you shall finde for 6 bushels that he taketh of wheat, he must take 6 bushels of Rye and 12 bushels of Barley.

d.

22 { 23 — 6
24 — 6
16 — 10 and 2, or 12.

5. A Mint Maister hath billion of 9 ounces 10 penie weight fine, and of the same he would make money which should be but of 6 ounc. fine, and therefore it behoueth him to melte Copper therewith

therewith, which is valued at 0 penie weight of fine. The questiō is to know how much siluer and copper hee must put together? After that you haue put downe 9 ounc. $\frac{1}{2}$, for the valew of the siluer, and right vnder the same, 0, for the copper you must take the difference of 6 from 9 $\frac{1}{2}$, whiche is 3 $\frac{1}{2}$, and place the same summe righte agaynste the 0, for to signifie the portion of copper that he must take:

$$6\left\{\begin{array}{lll} 9\frac{1}{2} & \text{———} & 6 \text{ li. sil.} \\ 0 & \text{———} & 3 \text{ li. cop.} \end{array}\right.$$

And the difference of 0 from 6, is 6, the same you must set right agaynst 9 $\frac{1}{2}$, which shall represent the portion of siluer that hee must take. And thus you see, that for 6 li. of siluer that he taketh, he must take 3 li. $\frac{1}{2}$ of copper, to make the sayd mony at 6 ounces fine.

And if he had three sortes of Siluer billion, that is to say, of 6 ounces fine: of 7 ounces fine: and of 9 ounces fyne: and hee woulde make money thereof

which should be but of 5 ounces fine, it behoueth him to mixe copper therewith. And this forme following doth shew how the same must be continued, and likewise how much he must take of euery sorte.

5	6	5
	7	5
	9	5
	0	1, 2, 4, all is 7

6. Likewise, a Mint master hath bullion of Golde, at 9 karets fine, some at 22 karets fine, som at 24 karets, which is full fine without corruption, and he will make coyne thereof, which shall be of 23 karets fine, it is demaunded how much he must take of euery sorte. *Answere*, make your alligation as this forme herevnder sheweth.

23	19	1
	22	1
	24	4, 1, all is 5.

More;

More, the sayde mayster hath golde of 20 karets ½ fine, and of 22 karets fine, and he will allay the same to 18 karets fine. And for to doe the same, it is conueniente for him to mixe siluer there with, whiche is esteemed at 0 karets fine, but procceding according to this rule, he shall finde that for 18 poūd waighte, or other portions that hee taketh of the two sortes of Billion of golde, he must take 6 li. waight ½ and ½ of siluer, to allay the same vnto 18 karets fine.

18	$20\frac{1}{2}$	18	
	22	18	
	0	$12\frac{1}{2}$, 4. þ is $6\frac{1}{2}$.	

Agayne, the sayd maister hath 100 pound waight of golde at 22 karettes fine, and 10 pound waighte at 19 karets fine. The which he will allaye to 20 karets fine. The question is whether he ought to mixe any siluer with the same, yea or no, and howe muche.

Answere, you must consider (by ÿ first part of the rule of Alligation) the alloy of ÿ 100 li. & of the 20 li. being melted together, and you shall finde that the same is of 21 $\frac{1}{2}$ karects fine, and therefore for as much as the same is yet of a better finenesse then he would haue it, he must therefore mixe siluer therwith, that is to say for 20 pound waighte, or portions of golde, he must take thereto j li. $\frac{1}{2}$ of siluer.

$$20\left\{\begin{array}{l} 21\frac{1}{2} \quad 20 \\ 0 \quad\quad 1\frac{1}{2}. \end{array}\right.$$

8. If he had x li. waighte fine siluer of 12 ounces fine, I demaunde howe much copper hee muste mixe with the same, to allay it unto 11 ounces $\frac{1}{4}$ fine, that is to say, to 11 ounces 5 penny waight fine, make your Alligation as before is taught. Then diuide the portion of Copper, by the portion of fine, and you shall finde $\frac{3}{45}$, whiche being abbreuied, is $\frac{1}{15}$. And thus to every li. waighte

waight of siluer, you must take $\frac{1}{11}$ of a li. of copper, and for euery 11 pounde $\frac{1}{4}$ of siluer, you must take $\frac{1}{4}$ of a li. of copper. And so is to be done with the same, in case that it were of any other alloy.

9. A Maister hath 1 li. of fine Golde of 24 karets fine, the which he woulde allay to 22 karets fine: The question is to know howe much siluer must bee mixed with the same, that it may be of ye finenesse of 22 karets as before. *Ans.* take the difference of 22 to 24, which is 2. Then diuide 2 by 22, whiche you cannot, for they are $\frac{2}{22}$, but abbreuiate them, and it is $\frac{1}{11}$. And so much siluer must bee mixed with 1 li. waighte of fine golde that the same may bee of 22 karets fine.

10. A Goldsmith hath 1 li. waighte of siluer billion of 7 ounces fine, it is demaunded how much fine siluer, hee must put to the same, that being molten togeather, it may be of 10 ounces

fine? Answere, make your Alligation of 7, and 12 unto 10, and then diuide the portion of the fine siluer by the portion of siluer billion, and you shall finde 1 $\frac{1}{2}$: and thus 1 pounde waight of 7 ounces fine, you must take 1 li. $\frac{1}{2}$ of fine siluer of 12 ounces fine, to make the same of 10 ounces fine.

11. A Marchaunt hath giuen order unto his Factor to imploye him 83 li. 6 s. 8 d. sterling in 5 sortes of spices, that is to say, in Nutmegs of 80 d. the pound, Cloues at 76 d. the pounde, Synamon at 52 d. the pounde, Ginger at 34 d. the pound, and pepper at 30 d. the pounde. But he hath not appointed him the quantitie or portion which hee should buy of euery sorte, neither yet of al the sorts together, the question is to know how much the Factor must buy of euery sort to haue of each of the like quantity, Answere, you must adde 80, 76, 52, 34, and 30 together, and they make 272. Then you must diuide 83 li. 6 s. 8 d. being reduced into pence, name-

ly 20000 d. by 272, & thereof commeth 73 li $\frac{0}{17}$. And so many poundes muste he buy of euery sort of the saide spices.

12 But in case he woulde not haue so many poundes of the one sorte, as he would haue of the other, then you must take another middell valure, betweene the saide particulers, as for example, let the meane number be 50 d. Then reduce the saide 83 li. 6 s. 8 d. into pence, as the other prices are, & they doe make 20000 pence, the same you must diuide by 50 pence, which is the meane or common price, and thereof will come 400 li. And so many poundes must hee haue of all the sortes togeather. Then if you will know how many pounds he must haue of euery sorte, you must set downe your particuler prices, after the middle valure, that is to say after 50 d. as heereafter followeth. And then worke by the rule of thre, and you shall finde.

50 { 80, 76, 52, 34, 30 } (20, 16, 16, 26 and 2, all is 28, 30)

110

110 giue 400, what { 20: *Ans.* 72 $\frac{8}{11}$ | 16: *Ans.* 58 $\frac{2}{11}$ | 16: *Ans.* 58 $\frac{2}{11}$ | 28: *Ans.* 101 $\frac{9}{11}$ | 30: *Ans.* 109 $\frac{1}{11}$ }

400

The 14 Chapter treateth of the *Rule of falsehood or false positions.*

The Rule of falsehoode is so named, not for that it teacheth any deceite or falsehoode, but that by fained numbers taken at all aduentures, it teacheth to finde out the true number that is demaunded, and this of all the vulgar Rules which are in practise) is the most

most excellẽt: this rule hath two parts the one is of one false position alone, the other is of two positions, as hereafter shall appeare.

Those questions whiche are done by false positions, haue their operations, in a maner like vnto that of the rule of three: but only that in the rule of three, we haue three numbers knowen, and here in this rule, we haue but 1 number that commeth in vse to work by: vnto the likenesse whereof we must deuise two other numbers, the one multiplying, and the other diuiding, as by example.

1. I haue deliuered to a banker, a certaine summe of poundes in money, to haue of him by the yeare simplye, 6 li. vpon the 100 li, And at the ende of 10 yeares, he payde me 500 l. for all, both principall and gayne. I demaunde howe muche was the principall summe that I deliuered him at the first? Here you see that there are diuers termes: but the chiefe to worke withall is 500

li. whiche commeth of the other numbers, that is to say, of 10 and 100, for of them is composed or made the tenor of the question, the practise whereof is thus:

Let vs fayne a number at pleasure, and with the same lette vs make oure discourse, euen as though it were the principall summe that wee seeke for. As by example. Suppose that I deliuered him at the first 200 li. the which were worth to me in ten yeares, 120 li. after the rate of 6 li. vppon the 100 li. Then 120 li. added with 200 pound do make but 320 li. and I must haue 500 pound. Thus you see that I haue three termes for the rule of 3: the one whiche shall contayne the Question, the other two whiche I haue formed artificiallye, whiche 200, and 320: in suche sorte that 320 oughte to haue such proportion to 200, as 500 hath vnto the number that I seeke: that is to say, vnto the true principall summe, then muste I haue recourse vnto the Rule of three after this sorte, saying:

If

If 320 li. be come of 200 li. of howe much shall come 500 li. I do mulriply 500 by 200, and they are 10000, the which I must diuide by 320 li. & thereof commeth 312 li. $\frac{1}{2}$, which is ẏ summe that I deliuered at the first. And thus this rule hath some congruence with the double rule of three.

2. I haue a Cesterne with 3 vnequall cockes conteining 60 pipes of water: and if the greatest cocke be opened, the water will voyde cleane in one howre, at the second it will auoyd in 2 houres, and at the thirde it will require three houres: Nowe I demaunde in what space it will auoyde, all the cockes being set open? *Answere*, Suppose that it will auoyde in halfe an houre, that is to saye in 30 minutes. Then muste there auoyde at the firste Cocke the $\frac{1}{2}$ which is 30 pipes: and by the seconde cocke the $\frac{1}{4}$, which is 15 pipes, and by the third cocke the $\frac{1}{6}$, that is 10 pypes, all the whiche summes being added together, doe make 55 pypes: but it

should

should be 60 pipes. Therefore saye by the rule of 3, if 55 pipes doe voyd in 30 minutes: in how many minutes will 60 pipes voyde: multiply and divide, and you shall finde 32 minutes $\frac{40}{55}$, ye which $\frac{40}{55}$ being abbrevied are $\frac{8}{11}$ of a minute, and in that space will the water voyde if all the cockes be set open.

Of the rule of two false positions.

THE summe of this Rule of two false positions is thus, when anye question is proponed appertayning to this rule: First you must imagine any number at your pleasure, which you shall name the first position, and with the same shall you worke in steede of the true number, as the question doth impoꝛte, and if you see that you have missed of the true number that you doe seeke. Then is the last number of the woꝛke, eyther too greate oꝛ to little, the which number, you shall note with the signe of moꝛe oꝛ lesse,

or that is the firste error in the which you haue fayled, the whiche signes of more, & lesse, shall be noted with these figures ×, —, This figure ×, betokeneth more: and this plaine line —, signifieth lesse: that is to say yͤ one signifieth to muche, and the other to little: then you must begin agayne, and take another nūber, which shalbe the seconde position, and worke by the question as before, yf you haue fayled agayne, note the excesse or want, for yͭ is the seconde er ror. Then shall you multiply the first position by yͤ second error crossewise, & againe the seconde position by the first error, (and this must alwaies be obserued) and you must keepe the two productes: then if the signes be bothe like, that is to say, either both to muche, or both to little, you shall abate the lesser product from the greater, & likewise, you shall subtract the lesser error from the greater, and by the remayne of those errors, you shall deuide the residue of the products, the quotient shalbe the true number,

number that you seeke. But if the two signes be vnlike, that is to say the one to much, and the other to little, then you shall adde those productes togeather, and likewise you must adde both the errors togeather, and by the summe of those errors diuide the totall summe of both the products: the quotient shall be the true number that you doe seeke, and this is the whole rule, as by these examples followinge it will appeare more playne.

Example.

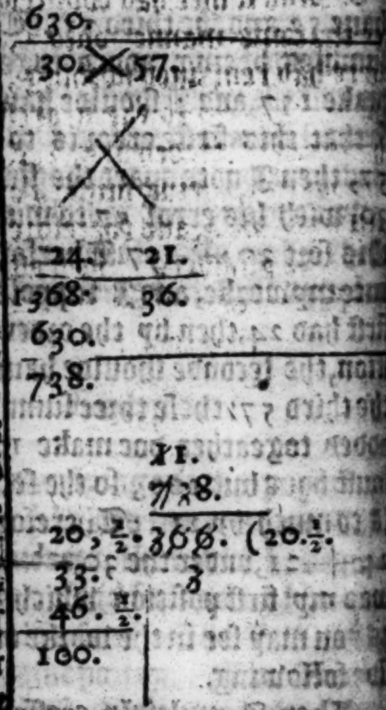
3. A man lyinge at the poynte of death saide that he had in a certaine Coffer 100 Duckets, the which he bequethed to three of his friends by him named after this sorte. The first must haue a certaine porcion. The second must haue twise so many as the first abating 8 Duckets: and the third must haue three times so many as the first lesse by 15 Duckets. Now I demaunde how many euery of them must haue.

Answere.

Answere: first I doe imagine ỹ the first man had 30 Duckets, then by the or-der of the question, the second shoulde haue 52, and the third 75. These three summes beeing added togeather doe make 157, and I shoulde haue but 100 so that this firste error is to muche by 57, then I note apart the first position 30, with his error 57 to muche after this sort 30, ⊥ 57. Therfore I prose-cute my worke, and I suppose that the first had 24, then by the order of ỹ que-stion, the seconde shoulde haue 40, and the third 57: these three summes being added togeather doe make 121 and I must haue but 100, so the second error is to much by 21. Therefore I note 24 ⊥ 21, vnder the 30 ⊥ 57, which was my first position which the error as you may see in the worke on the next page following.

Then I multiply crossewaies 30 (whiche is the first position) by 21 which is the seconde error and there-commeth 630. Likewise I multi-ply 24, (which is the seconde position)

by 57 which is the firste error, and I finde 1368: then bicause the signes of the errors are bothe like: that is to saye, bothe to muche, I must therfore subtract 630 frō 1368, and there will remain 738 which is ỷ diuidend: againe I must subtract ỷ lesser errour from the greater, that is to say 21, out of 57, and there will remaine 36, which shall bee my diuisor. This done I diuide 738 by 36, and the quotient will be 20, ½.



The

The which 20 $\frac{1}{2}$, is the iust number of the Duckets that the first man had for his parte, so consequently the second man had 33 Duckets, and the thirde 46 $\frac{1}{2}$, as by the working afore may appeare.

The like number will also appeare, n case the errors were both too little, s in making the two positions by 8, and 20 you shall nd that ỹ wo errors il be both o little, ỹ ste will to little 15, and e seconde little by as by pe-ing this k, you l well perceiue.

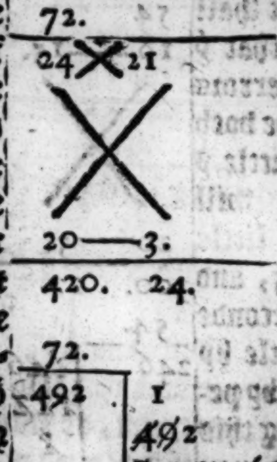
54
18 — 15.
20 — 3.
300. 12.
54.
246 | ~~246~~ (20 $\frac{1}{2}$.
~~122~~
~~1~~

Agayne if one of the errors were too

 much

muche, and the other too little, yet you shall haue the true number, as before. As if the two positions were 24, and 20, you shall finde that the first erroure will bee 21 too muche, and the seconde will be 3 too little. Therfore multiply 24 by 3 crossewaies, thereof commeth 72.

Likewise multiply 20 by 21, the product will be 420. These two summes 72, and 420, you shall adde together, because the signes of the errors bee vnlike, and they make 492, ye whiche shall be your diuidende, & agayne, adde the lesser error 3, with ye greater error 21, and they make 24, for your diuisor,



then diuide 492 by 24, the quotiente will be 20 $\frac{1}{2}$: as before doth playnlye appeare.

And now because you shal not forget this parte of the rule, learne this briefe remembraunce following.

The signes both like, subtraction do require.
And unlike signes, addition wil desire.

¶ The meaning whereof is thus, if both the errors haue like signes, then muste the diuidende and the diuisor be made by subtraction, as is taughte before, and if those signes be unlike, then must you by addition gather the diuidende, and the diuisor, as I haue done in this last example.

Another Example.

4. A man hath two siluer cuppes of unequall waight, hauing to them both but one couer, the waight whereof is 5 ounces, if the couer be put to the lesser cuppe, it will bee in double proportion

vnto the waighte of the greater, and the Couer being putte to the greater cuppe, it will bee in triple proportion vnto the waighte of the lesser. I demaund what was the waight of euerye Cuppe? Answere: suppose that the lesser Cuppe did weigh 7 ounces, then with the couer it must weigh 12 ounces, and this waighte shoulde bee in double proportion vnto the greater, therefore the greater must weigh but 6 Ounces, adde vnto it 5 ounces for the Couer all will be 11 ounces, but it shoulde bee 21, for to haue it in triple proportion vnto 7. which represeteth the waight of the lesser cuppe, so that

105.

7 — 10.

9 — 15.

90. . 5.

105.

90. 15. (3 ounces,

15 8

this

this first error is to little by 10, which you shall note after 7 in this sorte, 7—10.

And you shall suppose some other number, as 9, and make the like worke as before, so you shall finde 15 to little for the seconde error, whiche you shall put behinde 9 with the signe lesse thus —15, and then worke with the reste as aboue is saide, and you shall finde that the lesser cuppe weighed three ounces, and consequently the greater foure ounces.

5. One man demaunded of another in a morning, what a clocke it was, the other made him this answere, if you doe adde (sayth hee) the $\frac{1}{4}$ of the howers which bee past since midnight with the $\frac{2}{3}$ of the howers which are to come untill noone, you shall haue the iust hower, that is to say, you shall know what a clocke it was. *Answere.* Suppose that it was 4 a clocke in the morning, so shoulde there remaine 8 untill noone, then I take the $\frac{1}{4}$ of 4

which is 1, and the $\frac{2}{3}$ of 8 which is 5 $\frac{1}{3}$, and I adde them togeather, so I find 6 $\frac{1}{3}$, and I supposed but 4, therefore this first error is to much by 2 $\frac{1}{3}$, which I note after my position, thus 4 ✕ 2 $\frac{1}{3}$ then againe I suppose an other number, that is to say 9: so should remaine but 3 howers untill noone. I take the $\frac{1}{4}$ of 9 and the $\frac{2}{3}$ of 3, which is 2 $\frac{1}{4}$ and 2: these I adde togeather, and they make 4 $\frac{1}{4}$: but I supposed that it was 9 therefore the seconde error is 4 $\frac{3}{4}$ to little, which I note behinde my Position thus. 9 —— 4 $\frac{3}{4}$.

And then I multiply crossewise, as before is taught, and bicause the signes of the errors are unlike, that is to saye, the one to much, and the other to little, therefore in this worke I must adde the productes, and

19

4 ✕ 2 $\frac{1}{3}$.

9 —— 4 $\frac{3}{4}$.

21   7 $\frac{1}{12}$.

19

40

they will be 40. Likewise I must adde the errors and they be $7\frac{1}{12}$. Then I diuide 40 by $7\frac{1}{12}$, and therof commeth 5 howers $\frac{11}{17}$, and that hower it was in the morning.

The 15. Chapter treateth of diuers *questions extraordinarie, euery one of them containing a generall rule for such like examples.*

1 Fiue men diuising of their ages. The first saide to the others, þ he was 120 yeres of age. The second said if my yeares were doubled, then should I haue so many yeares more then the first man, as the firste hath nowe more then I haue: The thirde saide in like maner, if my yeres were tripled. The fourth said if my yeres were quadrupled, that is to say multiply by 4: the the fifth saide that if his yeares were quintupled, that is to say multiplyed by 5, that they should each of them haue so many yeeres more then the first man

as

as he hath now more then euerie one of them. The question is to know, how olde euery of the other 4 men were. Answere, you must take the numbers which are nearest collaterals, in naturall order vnto 2, 3, 4, and 5, by reason of dupling, tripling, &c. And the greater of euery of the saide numbers collaterals, must be your Denominator, to the lesser number, As thus, the nexte collaterall numbers vnto 2, are 1 & 3, which is $\frac{1}{3}$. Likewise ye nexte collateral nūbers to 3 are 2, and 4 which is $\frac{2}{4}$. and so for 5, are 2, & 5, which are $\frac{2}{5}$, and for 5, are 3, and 6, whiche be $\frac{3}{6}$, Then if you will knowe the seconde mans age, you must adde vnto 120, the $\frac{1}{3}$ of it selfe which is 40, all is 160, the same you must diuide by 2, and thereof commeth 80 yeares, so olde was the seconde man. And for to knowe the age of the thirde man: you must adde vnto 120 his owne $\frac{2}{4}$, that is to saye his $\frac{1}{2}$, whiche is 60: And they make 180. The said summe you must diuide by 3, and thereof commeth 60 yeares

for

for the thirde mans age, and after the same manner you shall finde that the fourth man had 48 yeares, and the fifte had 40 yeares. The proofe is verye easie.

2 A man hauing his eye sight somewhat altered, began to tell and reckon a certayne number of byrdes to bee in all 18. His Companion that had a clearer sight, beholding wel the birds, aunswered him, that there were not 18, but sayde he, if there were twise so many more as there are, there shoulde be as many more aboue 18, as there be now lesse then 18. The question is to knowe, howe manye birdes there were in all? *Answere*, you must adde vnto 18 his $\frac{2}{4}$, that is to saye his $\frac{1}{2}$ and thereof will come 27, the whiche you shall diuide by 3, and thereof commeth 9. And so many birdes there were in all.

3. A Draper hath boughte 24 sorting clothes, and he hath solde 100 poundes

worth

worth the same clothes vpō the which hee hath gayned as muche as 1 Cloth did coste him. I demaunde what one of the sayd clothes did cost him? *Answere*, you must adde 1 vnto 24, & they make 25. Then diuide 100 by 25, & thereof will come 4 li. and so muche did one cloth cost him.

4 A mayde carried egges vnto the market, and it happened a merrie Fellowe to meete her, who began to least with her, in such sorte, that hee ouerthrewe her Basket, and brake all her egges: the mayde being muche displeased with him for breaking of the same, sayd very earnestly vnto him that he should pay for them, the man considering with himselfe, that by his follye they were broken, aunswered the maid, that he would pay her for them, and therefore hee demaunded of her, what number she had: the sielie poore wenche that coulde not well reckon, sayde vnto him, that shee coulde not well tell him, but sayd she, when I did put them

into

into my basket by 2, and by 2, there remayned 1 egge: and when I counted them by 3 and by 3, there remayned 1, and when I did reckon them by 4 and by 4, there remayned still one: but when I did count them by 5 and by 5, there remayned none. The question is to know, how manye egges the mayde had in all? *Answere,* For to doe this, and all such like questions, you muste multiply 2, 3, and 4, together, saying 2 times 3 make 6, and 6 times 4 make 24, unto this number you must adde 1, and they make 25. And so many egges she had in al. But if she had had a greater number of egges that shee mighte haue counted them till she came to 7 & 7, after the same maner as she did, till she came to 5 and 5: you must multiply these numbers 2, 3, 4, 5, and 6, the one by the other, and thereof will come 720, unto the which adde 1, and they make 721. And so many egges she should haue had if shee had counted them by 7 and 7.

5. Againe,

5. Agayne, if she had sayde that when she counted her egges by 2 and 2, there remayned 1, and by 3 and 3, there remayned 2, and by 4 and 4 there remained 3: and by 5 and 5, there remayned nothing, the question is to know howe many egges she should haue had? *Answere*: you must finde a number, the least that you can possible, which maye be diuided by 2, by 3, and by 4, that is to say, 12 is the nearest number, diuide the same by 5, and there remayneth 2. This being done, you must finde 2 numbers, the least that is possible, whiche maye be diuided by 5, and by 2, in such sort, that the nůber which is diuided by 2, may exceede the other that is diuided by 5, onely by 1, and those 2 numbers are 10 & 6, for if you diuide 6 by 2, your quotient will be 3, and 10 diuided by 5, bringeth but 2: then consider that 6 conteineth 3 times 2, And therefore you muste multiplye 12 by 3, and they make 36, from the which you must subtract 1, and there will remayne 35 which is the number

that

that is required to be found.

6. And if shee had counted them after the same manner unto 7, and that there had remained nothing, then you knowe that 60 is the nearest number that may be diuided by 2, 3, 4, 5, and 6, the which 60 being diuided by 7, there will remaine 4, and therefore you must finde two numbers, the least that may be, that can be diuided by 4, and 7, in such sorte, that that number whiche is diuided by 4, maye excede the other, number (by 1) that is diuided by 7, the whiche 2 numbers are 7 and 8, for if you diuide 8 by 4, your quotient will be 2. And diuiding 7 by 7, youre quotient will be 1, and therefore for because that 8 contayneth 2 times 4, you must multiply 60 by 2, and therof commeth 120, from the which number you shall subtract 1, and the residue which are 119, is the number that is required.

7. A theefe entring into a Garden to steale from thence a certaine number

ber of Apples: And at his comming forth, he did meete with 3 men, one after another, who threatned to accuse him: and for to appease them, hee gaue vnto the firste, the $\frac{1}{2}$ of all his Apples, who receaued the same with thankes, but he returned him 12 of them backe againe. Then he gaue vnto the second the $\frac{1}{2}$ of them that he had remaing who receaued the same, but hee gaue him backe againe 7 Apples, and so he gaue vnto the thirde man the $\frac{1}{2}$ of the residue who returned him foure. And in the ende he had still remaining 20 Apples. The question is to knowe howe many Apples he gathered in the saide Garden? Answere, for to doe this you shall subtracte 4 from 20, and there will remaine 16, the same you shall double, they make 32, from the which you must abate 7, and there will remaine 25, the same you shall double, and they make 50: from the which you shall subtract 12, and there will remaine 38: whereof the double which is 76 doeth shew the number of Apples that hee gathe-

red

red. This and such like questions are easie to be done in going backewardes from the ende of the question, untill you come to the beginning thereof. But if he had giuen the $\frac{1}{3}$ unto one of them, the $\frac{1}{2}$ unto an other, and $\frac{1}{4}$ unto the last, or any other, all the same may be done by the conuerse rule, that is to say, beginning at the ende of the question, till you come to the beginning, as before is saide.

8. A marchant did ride unto three seuerall fayres: at the firste hee doubled his money, and spent 10 crownes, at the second fayre he did also double his money, and spent 10 crownes: And likewise at the third faire he did double his money, and spent 10 crownes, and in the end, he found that he had remaining but 2 crownes. The question is to knowe howe many crownes hee had at the first: *Answere*: for to doe this, you must adde unto 10 crownes, the 2 crownes which hee had remaininge, so they make 12, whereof you shall

take the $\frac{1}{2}$ which is 6: againe adde 6 unto 10, and they make 16, whereof you shall take the $\frac{1}{2}$ which is 8: finally you shall adde 8 unto 10, and they make 18, whereof you must take the $\frac{1}{2}$ which is 9: and so he had 9 crownes at the first.

9. A Burgeois would distribute a certaine summe of pence unto divers poore men equally, but after that he had counted howe manie they were in number, he perceived that if he should give unto every man 6 d, he should want 14 pence, But if he should give every man 5 pence the peece, he should have 9 pence remaining, the question is to knowe the number of the poore men. Answere, for to doe this, and such like questions, you muste have in remembrance this principle, more from more, or lesse from lesse. &c. Which is sette foorth in 3 verses in the Rule of false positions, that is to say, you must adde the lesse with the more. Namely 14 with 9, and they make 23: and so

the

[di]uide the same summe by the difference
[w]hich is of 5 from 6, that is 1. And
[th]erefore you must diuide 23 by 1, but
[it] doeth neither multiplye nor diuide,
[th]erefore you may conclude & say, that
[th]ere were 23 poore men.

10. And if he should giue to euery
[m]an 5 pence, he should haue 19 pence
[re]mayning, and giuing euery man 7 d.
[h]e should haue 3 d. ouer: In this case
[yo]u must abate more from more, that is
[to] say 3 from 19, and the rest whiche is
[1]6 you must diuide by 2, which is the
[d]ifference of 5 from 7: & the quotience
[w]hich is 8, doth shew you the number
[of] the poore men, and likewise that if he
[ha]d had both wants, that is, if both the
[nu]mbers had bene too little, you muste
[ha]ue done with them, as you did with
[th]e others that were both more.

11. A manne hath giuen vnto 20
[si]ckefolke 20 s. that is to saye, vnto
[me]n, women, and boyes: vnto men

hee gaue 20 pence a peece, vnto women 15 pence, and vnto boyes he gaue 8 pence. The question is to know how many men? howe manye women? and howe manye boyes there were in all?

Answere, First you must take the difference of 8 from 15, & also from 20: you shall haue 7 for the difference of the women, and 12 for that of the men: this done, you may suppose that there were 20 boyes, the whiche at 8 pence the peece maketh 160: the which you must abate from 20 s. being reduced into pence, that is, from 240 pence: there will remaine 80 pence, the which 80 you shall diuide into 2 suche partes that the one may be diuided by 7, and the other by 12, and that nothing may remayne after the diuisions are made. The which 2 numbers are 56, and 24. For 56 being diuided by 7, bringeth into the quotient 8, and 24 beeing diuided by 12, will bring in the quotient 2: whiche sheweth that there was 8 women, 2 men. And the rest of the 20, which are 10, were boyes, so there were

were 8 women, 2 men, & 10 boyes, Some men doe call this rule, the virgins rule.

The sixt Chapter treateth of sportes *and pastime, done by number.*

If you would know the nūber that anye manne doeth thinke or imagine in his minde, as though you could diuine.

Bid him triple the same number, then of the product let him take the ½ if the number be euē, or else the greater half, if the same be odde, then bid him triple agayne the sayd ½: after say to him that he shall put away if he can 36, 27, or 9, from the laste number being tripled: that is to saye, cause him subtlelye to put awaye 9 as many tymes as is possible, and keepe the number secretely: and when he can no more take away 9, then to know if that yet there remayne any number, bid him abate 3,

2, or 1, if he cã, this done see how many times 9 you haue caused him to abate, for the which keepe you in mind so many tymes 2, and if that you knowe that he had any thing remaining besides the nines, ỷ same shal also note vnto you 1.

Example.

Suppose that he thought 6, whiche being tripled is 18, whereof the ½ is 9, the triple of that is 27: now cause him to abate 18, or 9, or 27: and agayne 9, but then he will say vnto you that hee cannot, bid him then abate 3, or 2, or 1, he will say also that he cãnot, wherfore considering that you haue made him to abate three times 9 iustlye, you shall tell him that he thought 6, for 3 times 2 maketh 6. If he had thought 5, the triple thereof is 15, whereof the greater ½ is 8, the triple of that maketh 24, whiche conteyneth two times 9, they are worth 4, and the remayn signifyeth 1, the which added together, make 5, which is the number that he thought

2.

2. If in any company, one of them hath a ring vppon his finger, and you would know by manner of deuining, who hath the same, and vpon what finger and what ioynt: cause the persons to set down in order, and keepe likewise an order of their fingers, then seperate your selfe from them in some certaine place, and say vnto one of the lookers on, that he double the number (marking well in youre minde the order) of him that hath the ring: and vnto the double bidde him adde 5, and then cause him to multiply this addition by 5, and vnto the producte bidde him adde the number of the finger of the person whiche hathe the ring: Suppose that the same last summe did amount to 89, then afterwarde say to him that he put after the same last nũber towarde his right hande a figure signifying vppon which of the ioyntes he hath the ring, as if it bee vppon the third ioynt, let him put 3 after 89, and it will be 893, this done, you shall aske

him what number he keepeth from the which you shall abate 250, & you shall haue three figures remaining at the least. The first towarde your left hand shall signifie the number of the person which hath the ring. The seconde or middle figure shall represent the number of the finger. And the last figure towarde your right hande shall betoken the number of the ioynt, as if the number which he did keepe, were 883 from that you shall abate 250, & there will remaine 643, which doe note vnto you that the sixt person hath the ring vpon the fourth finger, and vpon his third ioynt.

But note that when you haue made your subtraction, if there doe remaine a cipher in ẏ place of tens, you must thē abate 1 from that figure which is in the place of hundreds, that is to say from the figure which is next your left hand, and that shall be worth 10 tenthes signifying the tenth finger: as if there shoulde remaine 703, you must saye that

that the sixe person (vppon his tenthe finger, and vpon his thyrd ioynt) hath the ring.

3. And after the same maner if a man doe cast three dice, you may knowe the payntes of euerye one of them, for if you doe cause him to double the points of one die, and vnto the double to adde 5, and the same summe to multiply by 4, & vnto the product adde the points of one of the other dice, and behinde the number toward the right hand, to put the figure which signifieth the pointes of the last die, and then shall you aske him what number he keepeth, from the which abate 250, and there wil remain 3 figures, which doe note vnto you the points of euery die.

4. Likewise, if 3 of your companions, to say, Peter, James, and John, would (in your absence) giue themselues euery one a contrary name: as for Example: Peter woulde bee called a king, James a Duke, and John a Countie: and you would diuide which of them is called a King, whiche the

Duke,

Duke, and which the Countie. Take 24 stones, or other peeces whatsoeuer and giue vnto Peter 1, vnto James 2, and vnto John 3, or otherwise. But marke well vnto which of them you haue giuen 1, vnto which 2, and vnto whome 3. Then leauing eyghteene stones (before them) that are remaining, you shall absent your selfe from their sight, or else turne your face from them, saying thus vnto them, whosoeuer nameth himselfe a Kinge, for euery stone that I gaue him, let him take 1 of the residue, and he that nameth himselfe a Duke, for euery stone that I gaue him let him take 2 of them that remaine, and he that calleth himselfe a countie, for euerie stone that I gaue him, let him take 4: this being done approche neare them, and marke howe many stones are remaining, and know this, that there cannot remaine anye other number but one of these sixe, 1, 2, 3, 5, 6 7, for the which sixe numbers we ha e hosen to euery one of them a seuer l name, which are these: *Angeli*

Beati,

Beati, Taliter, Meßias, Iſraell, Pietas: eche of them conteining three vowels, *a,e,i,* whiche doe ſhewe the names by order: that is to ſaye, the vowell *a,* ſheweth whiche is the King, the vowell *e,* telleth whiche is the Duke, and the vowell *i*, ſheweth whiche is the Countie: in folowing the order how, and to whome you haue giuen one ſtone, to whome 2, & to which 3, then if there do remayn but one ſtone, the firſt name *Angeli,* (by theſe three vowels a, e, i,) ſheweth that Peter is the King, James the duke, and John the Countie. And if there doe remayn 2 ſtones, the ſecõde name *Beati,* ſhall you ſhewe by theſe 3 vowels e, a, i, that Peter is the Duke, James the king, and John the County. And ſo of the other, as by this table doth playnly appeare.

1	2	1	2	3	3
2	1	3	3	1	2
3	3	2	1	2	1
a	e	a	e	i	i
e	a	i	i	a	e
i	i	e	a	e	a
1	2	3	5	6	7
A	*B*	*Γ*	*M*	*I*	*P*

FINIS.

¶ The agreement of the measures, and *waightes of diuers Countreis, the one with the other being reduced to an equalitie, and drawn into Tables, as followeth.*

London.

100 elles at London doe make at

Andwerp	$166\frac{2}{3}$
Nuremberg	$174\frac{1}{6}$
Francf. Liebzig, & Preslaw,	$208\frac{1}{3}$
Dantzick	$138\frac{1}{3}$
Vienne in Austri.	145.
Lions in Fraunce.	$101\frac{2}{3}$.
Parris in Fraunce.	095.
Rouan in Norm.	$086\frac{2}{3}$
Lishburne	100 vares.
Siuill & other places in Spay,	135.
The Isles of Maderc.	$103\frac{2}{3}$.
Venice	180 braces.
Lucques	200 braces.
Florence	$204\frac{1}{6}$ braces.
Millan	230
Geanes	$480\frac{5}{6}$. paulmes.

The like agreement hath 125 yards, vnto the measures aforesayde.

The agreement of the measure at *Andwerp with the measures at other places.*

Andwerpe.

100 elles at Andwerpe doe make at

London. yardes	75, & 60 elles.
Nuremberg	104 ½.
Francford.	125.
Dantzig	83
Vienne, &c.	87
Lions	60 aulnes.
Parris	57
Rouan	52
Lishburne	60 vares.
Siuil. &c.	81
The Isles. &c.	62
Venice	108 braces.
Lucques	120
Florence	122 ½
Millan	138.
Geanes	288 ½ paulmes.

The agreement of the measure at *Nurẽberg with the measures at other places.*

Nuremberge.

100 elles at Nurẽberg doe make at

London.	$57\frac{2}{5}$	elles.
Andwerpe	$95\frac{2}{5}$.	
Francford.	$119\frac{3}{5}$	
Dantzig	$79\frac{1}{2}$	
Vienne, &c.	$83\frac{1}{4}$	
Lions	$58\frac{1}{3}$	aulnes.
Parris	$54\frac{1}{2}$	
Rouan	$49\frac{3}{4}$.	
Lishburne	$57\frac{2}{3}$	vares.
Siuil. &c.	$72\frac{1}{2}$	
The Isles. &c.	$58\frac{1}{3}$	
Venice	$103\frac{1}{3}$	braces.
Lucques	$114\frac{4}{5}$	
Florence	$117\frac{1}{5}$	
Millan	132.	
Geanes	276	paulmes.

The agreement of the measure at *Franckeford with the measures at other places.*

Eranckford.

100 elles at Frankforde doe make at	London	48	elles.
	Andwerpe	80	
	Nuremberge	83 $\frac{3}{5}$.	
	Danzicke	66 $\frac{2}{5}$	
	Vienne. &c.	69 $\frac{3}{5}$.	
	Lions	58 $\frac{4}{5}$.	aulnes.
	Parris	45 $\frac{2}{5}$.	
	Rouan	41 $\frac{3}{5}$.	
	Lishborne	48	vares.
	Siuill &c.	64 $\frac{4}{5}$.	
	The Iles &c.	49 $\frac{2}{5}$.	
	Venice	86 $\frac{2}{5}$.	braces.
	Lucques	96 .	
	Florence	98 .	
	Millan	110 $\frac{2}{5}$.	
	Geanes.	239 $\frac{4}{5}$.	paulmes

The agreement of the measure at *Dantzicke, with the measures at other places.*

Dantzicke.

100 elles at Dantzike doe make at	London	72 $\frac{1}{4}$ elles.
	Andwerpe	120 $\frac{1}{2}$.
	Nuremberge	125 $\frac{7}{8}$.
	Franckford	150 $\frac{5}{8}$.
	Vienne. &c.	107 $\frac{1}{2}$.
	Lions	73 $\frac{1}{2}$. aulnes.
	Parris	68 $\frac{5}{8}$.
	Rouan	62 $\frac{5}{8}$.
	Lishborne	72 $\frac{1}{4}$ vares.
	Siuill &c.	97 $\frac{1}{2}$.
	The Isles &c.	74 $\frac{5}{8}$.
	Venice	130 braces.
	Lucques	144 $\frac{1}{2}$.
	Florence	137 $\frac{1}{2}$.
	Millan	166 $\frac{1}{4}$.
	Geanes.	347 $\frac{1}{2}$. paulmes

The agreement of the meaſure at *Vienne, with the meaſures at other places.*

Vienne in Auſtrice.

100 elles at Vienne doe make at

London	68 $\frac{2}{7}$	elles.
Andwerpe	114 $\frac{9}{40}$.	
Nuremberge	120.	
Franckford, &c.	143 $\frac{5}{8}$.	
Dantzicke	25 $\frac{3}{8}$	
Lions	70 $\frac{1}{10}$	aulnes.
Parris	65 $\frac{1}{3}$.	
Rouan	59 $\frac{3}{4}$.	
Liſhborne	68 $\frac{9}{10}$	vares.
Siuill &c.	93 $\frac{1}{10}$.	
The Iſles &c.	71 $\frac{1}{15}$.	
Venice	124 $\frac{1}{8}$.	braces.
Lucques	137 $\frac{9}{10}$.	
Florence	140 $\frac{1}{4}$	
Millan	158 [illegible]	
Geanes.	331 $\frac{1}{5}$.	paulmes

Cc. The

The agreement of the measure at *Lions, with the measures at other places.*

Lions.

100 aulns at Lions doe make at	Place	Measure	Unit
	London	98 1/3	elles.
	Andwerpe	163 7/8	
	Nuremberge	171 1/4	
	Franckford, &c.	204 5/6.	
	Dantzicke	136	
	Vienne.	142 1/2.	
	Parris	93 2/3	aulnes.
	Rouan	85 1/4.	
	Lishborne	98 1/3	vares.
	Siuill &c.	132 3/4.	
	The Isles &c.	101 3/5.	
	Venice	177.	braces.
	Lucques	196 2/3	
	Florence	200 3/4.	
	Millan	226 1/5.	
	Geanes.	472 7/8.	paulmes

¶The agreemente of the measure at *Parris, with the measures at other places.*

Parris.

100 aulnes at Rouan do make at	London	105 $\frac{1}{4}$	elles.
	Andwepe	175 $\frac{2}{5}$	
	Nuremberg	183 $\frac{1}{3}$	
	Frankforde &c.	219 $\frac{1}{5}$	
	Dantzick.	145 $\frac{2}{5}$	
	Vienne	152 $\frac{3}{5}$	
	Lions	107	aulnes.
	Rouan.	091 $\frac{1}{5}$	
	Lishburne	105 $\frac{1}{4}$	vares.
	Siuill &c	142	
	The Isles. &c	108 $\frac{3}{4}$	
	Venice	189 $\frac{2}{5}$	braces.
	Lucques	210 $\frac{1}{2}$	
	Florence	214 $\frac{7}{8}$	
	Millan	242	
	Geanes	506 $\frac{1}{8}$	

¶ The agreemente of the measure at *Rouan, with the measures at other places.*

Rouan.

100 aulnes at Rouan do make at

London	115 5/8	elles.
Andwepe	192 1/4	
Nuremberg &c.	200 7/8	
Frankforde	240 5/8	
Dantzick.	159 3/5	
Vienne	167 1/4	
Lions	117 1/5	aulnes.
Parris	109 3/5	
Lichburne	115 3/8	vares.
Siuill	155 3/4	
The Isles, &c.	119 1/5	
Venice	207 2/5	braces.
Lucques	230 3/4	
Florence	235 1/2	
Millan	265 3/8	
Geanes	554 4/5	

The agreement of the measure at *Lishburne with the measures at other places.*

Lishburne.

100 vares at Lishburne do make at

London.	100 elles.
Andwerpe	166 $\frac{2}{3}$.
Nuremberg	174 $\frac{1}{6}$
Francford. &c.	208 $\frac{1}{3}$
Dantzig	131 $\frac{1}{4}$
Vienne.	145
Lions	101 $\frac{2}{3}$ aulnes.
Parris	095
Rouan	86 $\frac{2}{3}$
Siuil. &c.	135 vares.
The Isles. &c.	103 $\frac{1}{3}$
Venice	180 brares.
Lucques	200
Florence	204 $\frac{1}{6}$
Millan	230.
Geanes	480 $\frac{1}{6}$ paulmes.

The agreement of the measure at *Siuil. &c. with the measures at other places.*

Siuil. &c.

100 vares at Siuil. &c. doe make at

London.	74 elles.
Andwerpe	127 7/10.
Nuremberg	129
Francford. &c.	354 5/18
Dantzig	102 7/16
Vienne.	107 3/8
Lions	75 1/4 aulnes.
Parris	70 4/8
Rouan	64 1/8
Lishburne	74 vares.
The Isles. &c.	76 1/2
Venice	133 1/3 braces.
Lucques	148 1/8
Florence	151 3/16.
Millan	170 5/8
Geanes	356 1/4 paulmes.

The agreement of the measure at *the Isles of Madere, with the measures at other places.*

The Isles of Madere.

100 vares at ÿ Isles of Madere doe make at	London,	96 3/4	elles.
	Andwerpe	161 1/4	
	Nuremberge,	168 1/4	
	Franckford, &c	201 1/2	
	Dantzicke,	133 5/6	
	Vienne, &c.	140 1/3	
	Lions.	98 1/3	aulnes.
	Parris,	91 7/8	
	Rouan,	83 5/6	
	Lichburne	96 3/4	vares.
	Siuell, &c.	130 3/5	
	Venice	574 1/5	braces
	Lucques	193 1/2	
	Florence,	197 1/2	
	Millan,	222 1/2	
	Geanes,	465 1/4	paulmes.

The agreement of the measure at *Venice, &c. with the measures at other places.*

Venice.

	London,	55 $\frac{1}{2}$ elles.
	Andwerpe,	92 $\frac{1}{2}$.
	Nuremberge,	96 $\frac{3}{4}$.
	Franckford, &c.	115 $\frac{3}{4}$.
	Dantzicke,	76 $\frac{4}{5}$
	Vienne, &c.	80 $\frac{1}{2}$
	Lions,	56 $\frac{1}{2}$ aulnes.
100 bra-	Parris,	52 $\frac{3}{4}$
ces at Ve-	Rouan,	48 $\frac{1}{8}$
nice doe	Lishburne	55 $\frac{1}{2}$ vares,
make at	Sivell, &c.	75.
	The Isles, &c.	57 $\frac{2}{5}$.
	Lucques	111 braces
	Florence,	113 $\frac{2}{5}$.
	Millan,	127 $\frac{3}{4}$.
	Geanes,	267 $\frac{1}{6}$ paulmes.

The agreement of the measure at *Lucques with the measures at other places.*

Lucques.

100 bra-ces at Lucques, doe make at.

London.	50 elles.
Andwerpe,	$83\frac{1}{3}$.
Nuremberge,	76.
Franckford, &c.	$104\frac{1}{6}$.
Dantzicke,	$69\frac{1}{6}$.
Vienne,	$72\frac{1}{2}$.
Lions,	$50\frac{5}{6}$ aulnes.
Parris,	$47\frac{1}{2}$.
Rouan,	$43\frac{1}{3}$.
Lishborne,	50 vares.
Siuill, &c.	$67\frac{1}{2}$.
The Isles, &c.	$51\frac{2}{3}$.
Venice,	90 braces.
Florence.	102.
Millan	115.
Geans:	$240\frac{1}{3}$ paulmes.

The agreement of the measure at *Florence &c. with the measures at other places.*

Florence.

100 braces at Florence doe make at,	London.	49 elles.
	Andwerpe,	81 $\frac{3}{8}$.
	Nuremberge,	85 $\frac{1}{4}$.
	Franckford, &c.	102
	Dantzicke,	67 $\frac{3}{4}$
	Vienne, &c.	71
	Lions,	49 $\frac{3}{4}$ aulnes.
	Parris,	46 $\frac{1}{2}$.
	Rouan,	42 $\frac{2}{5}$
	Lishborne,	49 vares.
	Siuill, &c.	42 $\frac{2}{5}$.
	The Isles, &c.	50 $\frac{1}{5}$.
	Venice,	88 $\frac{1}{6}$
	Lucques,	97 $\frac{7}{8}$
	Millan	112. $\frac{3}{5}$
	Geanes:	235 $\frac{1}{5}$ paulmes.

¶The agreemente of the measures at *Millan, with the measures at other places.*

Millan.

100 braces at millan doe, make at	London	$43\frac{2}{5}$ elles.
	Andwerpe	$72\frac{2}{5}$
	Nuremberg	$75\frac{5}{8}$
	Frankeford &c.	$90\frac{1}{2}$
	Dantzick	$60\frac{1}{8}$
	Vienne	93
	Lions	$44\frac{1}{5}$ aulnes.
	Parris	$41\frac{1}{4}$
	Rouan	$37\frac{2}{3}$
	Lishburne	$43\frac{2}{5}$ vares.
	Sivill &c.	$58\frac{2}{3}$
	The Isles &c.	$44\frac{7}{8}$
	Venice	$78\frac{1}{4}$ braces.
	Lucques	$86\frac{7}{8}$
	Florence	$88\frac{3}{4}$
	Geanes	209 paulmes.

The agreemente of the measures at *Geanes, with the measures at other places.*

Geanes.

100 paulmes at Geanes do make at

London	26 $\frac{3}{4}$	elles.
Andwerpe	34 $\frac{3}{5}$	
Nuremberg	36 $\frac{2}{5}$	
Frankeford &c.	43 $\frac{1}{6}$	
Dantzick	28 $\frac{3}{4}$	
Vienne	30 $\frac{1}{8}$	
Lions	21 $\frac{1}{8}$	aulnes.
Parris	19 $\frac{3}{4}$	
Rouan	18	
Lishburne	20 $\frac{3}{4}$	vares.
Siuill &c.	28	
The Isles &c.	21 $\frac{2}{5}$	
Venice	37 $\frac{2}{5}$	braces.
Lucques	41 $\frac{1}{2}$	
Florence	42 $\frac{3}{5}$	
Millan	47 $\frac{3}{4}$	

¶The agreement of the waightes of diuers Countreis, *the one with the other being reduced to an equalitie, and drawn into Tables, as followeth.*

London.

112 li. waight at Londõ do make at

Andwerp	107 $\frac{5}{8}$
Francford	99
Collen & Ausberge	102 $\frac{1}{4}$
Nuremberg	100 $\frac{1}{8}$
Rouan	098
Lions in Fraunce.	[illegible]8 $\frac{1}{2}$.
Parris in Fraunce.	102 $\frac{1}{4}$
Diepe	100 $\frac{1}{4}$
Geneue	90 $\frac{3}{8}$
Tolouse	122 $\frac{3}{4}$
Rochell	124 $\frac{7}{8}$
Marceillis	124 $\frac{[illegible]}{4}$
Siuill &c.	109 $\frac{3}{4}$
Venice suttle waig.	166 $\frac{7}{8}$
Venice grosse waig.	105 $\frac{5}{8}$
Aquilla	157 $\frac{1}{4}$
Vienne in Austri.	89 $\frac{5}{8}$
Preslaw	134 $\frac{5}{8}$
Liebzig	101 $\frac{1}{4}$
Dantzig	129 $\frac{1}{4}$
Lubeck	97 $\frac{3}{8}$
Barcellone	143 $\frac{1}{2}$
Lishburne	99
Geanes	157 $\frac{1}{4}$

¶The agreement of the waighte at *Andwerpe, with the waights at other places.*

Andwerp.

100 li. waight at Andwerp do make at

London	104 li.
Francford	91 7/8
Collen &c.	94 7/8
Nuremberg	93
Rouan	91
Lions in Fraunce.	110
Parris in Fraunce.	96 1/4
Diepe	93
Geneue	84
Toloufe	114
Rochell	116
Marceillis	115 1/4
Siuill &c.	101 7/8
Venice suttle waig.	155
Venice grosse waig.	97 3/4
Aquilla	146
Vienne in Austri.	83
Preslaw	125
Liebzig	094
Dantzig	120
Lubeck	90 1/4
Barcellone	133 1/4
Lishburne	85 1/2
Geanes	146

The agreement of the Waighte at *Franckeforde, with the waight at other places.*

Franckeforde.

100 li. at Franckforde doe make at

London	113 1/8
Andwerpe	108 1/4
Collen, &c.	103 1/4
Nurembergе	102 1/8
Rouan	099.
Lions	119 5/8
Parris	103 1/4
Diepe	101 1/4
Geneue	91 1/4
Toulouse	124.
Rochell	126 1/8
Marseilles.	125 1/2
Siuill	110 3/4
Venice, &c.	168 1/2
Venice, &c.	106 3/8
Aquila	158 3/4
Vienne	090 1/4
Preslaw	135 7/8
Libezige	102 1/4
Dantzige	130 1/2
Lubecke	098 1/4
Barcellone	144 7/8
Lishburne	100
Geanes	158 5/4

The agreement of the Waighte at *Collen, and at Ausberge, with the waight at other places.*

At Collen and Ausberge.

100 Li. waight at Collen & Ausberge we make at

London	109 $\frac{1}{2}$
Andwerpe	105 $\frac{1}{4}$
Franckforw	096 $\frac{3}{4}$
Nuremberge	097 $\frac{7}{8}$
Rouan	095 $\frac{1}{4}$
Lions	115 $\frac{7}{8}$
Parris	100
Diepe	098
Geneue	088 $\frac{1}{2}$
Toulouse	120
Rochell	122 $\frac{1}{8}$
Marseilles.	123 $\frac{1}{2}$
Siuill	107 $\frac{1}{2}$
Venice, &c.	163 $\frac{1}{5}$
Venice, &c.	103
Aquila	153 $\frac{1}{4}$
Vienne	087 $\frac{1}{4}$
Preslaw	101
Libezige	099
Dantzige	126 $\frac{1}{9}$
Lubecke	095 $\frac{1}{4}$
Barcellone	140 $\frac{1}{4}$
Lishburne	096 $\frac{3}{4}$
Geanes	153 $\frac{1}{4}$

The agreement of the Waightes at *Nuremberge, with the waight at other places.*

Nuremberge.

100 li, at Nurēberge doe make at

London	111 $\frac{3}{4}$
Andwerpe	107 $\frac{1}{2}$
Franckford &c.	98 $\frac{7}{8}$
Collen, &c.	102
Rouan	97 $\frac{7}{8}$
Lions	118 $\frac{1}{4}$
Parris	102
Diepe	100 $\frac{1}{8}$
Geneue	90 $\frac{1}{4}$
Toulouse	122 $\frac{1}{2}$
Rochell	124 $\frac{1}{8}$
Marseilles.	124
Siuill	109 $\frac{1}{2}$
Venice, &c.	166 $\frac{5}{8}$
Venice, &c.	105 $\frac{1}{8}$
Aquila	157
Vienne	89 $\frac{1}{4}$
Preslaw	134 $\frac{1}{8}$
Libezige	101 $\frac{1}{8}$
Dantzige	129
Lubecke	97 $\frac{1}{4}$
Barcellone	143 $\frac{1}{4}$
Lishburne	98 $\frac{7}{8}$
Geanes	157

The agreement of the Waightes at *Rouan*, *with the waighs at other places.*

	Rouan.	
100 li, waight at Rouan do make at	London	114 1/4
	Andwerpe	109 7/8
	Franckford	101
	Collen, &c.	104 1/4
	Nuremberge	102 1/8
	Lions	120 7/8
	Parris	104 1/4
	Diepe	102 1/4
	Geneue	92 1/4
	Toulouse	125 1/4
	Roshell	127 1/4
	Marseilles.	126 1/4
	Siuill	112
	Venice, &c.	170 1/4
	Venice, &c.	107 1/2
	Aquila	160 1/4
	Vienne	91
	Preslaw	137 1/4
	Libezige	103 1/4
	Dantzige	131 7/8
	Lubecke	99 1/4
	Barcellone	146 1/4
	Lishburne	301
	Geanes	160 3/4

¶The agreemente of the waighte at *Lions, with the waight at other places.*

100 li. waight at Lions doe make at

	Lions.
London	94 $\frac{1}{2}$
Andwerpe	90 $\frac{7}{8}$
Frankford &c.	83 $\frac{1}{2}$
Colen	86 $\frac{1}{4}$
Nuremberg	84 $\frac{1}{2}$
Roan	82 $\frac{1}{2}$
Parris	86 $\frac{1}{4}$
Diepe	84 $\frac{1}{2}$
Geneue	76 $\frac{1}{4}$
Toulouse	103 $\frac{1}{2}$
Rochell	105 $\frac{1}{4}$
Marcellis	104 $\frac{1}{4}$
Siuill	092 $\frac{1}{2}$
Venice &c.	140 $\frac{3}{4}$
Venice. &c.	88 $\frac{7}{8}$
Aquila	132 $\frac{1}{2}$
Vienne	75 $\frac{1}{4}$
Preslaw	113 $\frac{1}{2}$
Liebzig	89 $\frac{1}{4}$
Dantzick	109.
Lubec	82
Barcellone	121
Lishborne	87 $\frac{1}{2}$
Geanes	132 $\frac{1}{2}$

Dd.ii.

¶The agreemente of the waighte at *Aquila, with the waight at other places.*

100 li. waight at Aquila do make at

	Aquila.
London	71 $\frac{1}{4}$
Andwerpe	68 $\frac{4}{8}$
Frankeford &c.	62 $\frac{7}{8}$
Collen	65
Nuremberg	63 $\frac{1}{8}$
Ronan	62 $\frac{1}{4}$
Lions	75 $\frac{1}{4}$
Parris	65
Diepe	63 $\frac{1}{8}$
Geneue	57 $\frac{2}{8}$
Toulouse	78.
Rochell	79 $\frac{3}{8}$
Marcellis	79
Siuill	69 $\frac{3}{4}$
Uenice &c.	106
Uenice. &c.	67
Uienne	56 $\frac{1}{4}$
Preslaw	85 $\frac{3}{4}$
Liebzig	64 $\frac{1}{4}$
Dantzick	82 $\frac{3}{8}$
Lubec	091 $\frac{1}{4}$
Barcellone	91 $\frac{3}{4}$
Lishburne	62 $\frac{7}{8}$
Geanes	100

¶The agreement of the waighte at *Diepe with the waights at o-ther places.*

100 li. waight at Diepe do make at

	Diepe.
London	$111\frac{1}{2}$
Andwerp.	$197\frac{1}{4}$
Francford	$98\frac{3}{4}$
Collen &c.	102
Nuremberg	$97\frac{7}{8}$
Rouan	$97\frac{1}{4}$
Lions in Fraunce.	$118\frac{3}{8}$
Parris in Fraunce.	102
Geneue	$90\frac{1}{8}$
Tolonse	$122\frac{3}{8}$
Rochell	$124\frac{1}{2}$
Marceillis	$123\frac{7}{8}$
Siuill &c.	$109\frac{1}{8}$
Venice suttle waig.	$166\frac{1}{8}$
Venice grosse waig.	105
Aquilla	$156\frac{1}{4}$
Vienne in Austri.	$89\frac{1}{8}$
Preslaw	$134\frac{1}{4}$
Liebzig	101
Dantzig	$128\frac{1}{4}$
Lubeck	$97\frac{1}{8}$
Barcellone	$143\frac{1}{8}$
Lishburne	$98\frac{1}{4}$
Geanes	$156\frac{1}{4}$

¶The agreement of the waighte at *Geneue with the waights at other places.*

100 li. waight at Geneue do make at

	Geneue.
London	123 $\frac{3}{4}$
Andwerp.	119 $\frac{1}{8}$
Francfort	109 $\frac{1}{2}$
Collen &c.	113 $\frac{1}{8}$
Nuremberg	110 $\frac{3}{4}$
Rouan	108 $\frac{1}{8}$
Lions in Fraunce.	131 $\frac{7}{8}$
Parris in Fraunce.	113 $\frac{1}{8}$
Diepe	98
Tolouse	135 $\frac{3}{4}$
Rochell	138 $\frac{1}{8}$
Marceillis	137 $\frac{3}{4}$
Siuill &c.	121 $\frac{3}{8}$
Venice suttle waig.	116 $\frac{1}{2}$
Venice grosse waig.	184 $\frac{1}{2}$
Aquilla	174
Vienne in Austri.	98 $\frac{7}{8}$
Preslaw	148 $\frac{7}{8}$
Liebzig	112
Dantzig	143
Lubeck	107 $\frac{1}{2}$
Barcellone	158 $\frac{1}{4}$
Lishburne	109 $\frac{1}{8}$
Geanes	174

The agreement of the waihtg at *Toulouse, with the waighte at other places.*

Toulouse,

100 li. waight at Toulouse doe make &c	London	91
	Andwerpe	87
	Franckford,	80
	Collen &c.	87
	Nuremberge	81
	Rouan	79
	Lions.	96
	Parris	83
	Diepe	81
	Geneue	73
	Rochell	101
	Marcelli&c	101
	Siuill	89
	Venice suttell &c.	135
	Venice grosse. &c.	81
	Aquila	128
	Vienne.	72
	Preslaw	109
	Liebzig	82
	Dantzicke	105
	Lubecke	79
	Barcellone	116
	Lisbburne	80
	Geanes.	126

The agreement of the waighte at *Rochell, with the waightes at other places.*

Rochell.

100 li, waight at Rochel doe make at

London,	89 $\frac{5}{8}$
Andwerpe	86 $\frac{1}{8}$
Franckford.	79 $\frac{3}{4}$
Collen, &c.	81 $\frac{1}{8}$
Nuremberge,	80 $\frac{1}{4}$
Rouan,	87 $\frac{1}{4}$
Lions.	94 $\frac{7}{8}$
Parris,	81 $\frac{7}{8}$
Diepe	80 $\frac{1}{4}$
Geneue	72 $\frac{1}{4}$
Toulouse	98 $\frac{1}{4}$
Marcellis	99 $\frac{1}{2}$
Siuell, &c.	87 $\frac{7}{8}$
Venice	133 $\frac{5}{8}$
Vienne, &c.	48 $\frac{3}{8}$
Aquila	125 $\frac{7}{8}$
Vienne	71 $\frac{1}{2}$
Presslaw.	107 $\frac{3}{4}$
Liebzig	81 $\frac{1}{4}$
Dantzicke,	103 $\frac{1}{8}$
Lubeck	77 $\frac{5}{8}$
Barcellone	114 $\frac{7}{8}$
Lishburne	97 $\frac{1}{4}$
Geanes,	125 $\frac{7}{8}$

The agreement of the waighte at *Marcellis*, *with the waightes at other places.*

100 li. waight at Marcellis doe make at.

	Marcellis.
London.	88 1/2
Andwerpe,	86 1/2
Franckford,	79 1/2
Collen &c.	82 1/4
Nuremberge,	80 1/2
Rouan,	78 7/8
Lions,	59 1/4
Parris,	82 1/4
Diepe	80 1/8
Geneue	72 1/2
Toulouse.	98 1/4
Rochell	100 1/2
Siuill,	88 1/4
Venice, &c.	134 1/4
Venice. &c.	84 3/4
Aquila	126 1/2
Vienne, &c.	71 7/8
Preslaw	108 1/4
Liebzig,	81 3/8
Dantzicke,	104
Lubecke	78 1/3
Barcellone	115
Lishburne	79 5/8
Geanes.	126 1/3

The agreement of the waighte at *Siuill, with the waightes at other places.*

Siuill.

100 li. waight at Siuill doe make at

London,	102
Andwerpe	98 1/2
Francksord.	79 5/8
Collen, &c.	93 1/8
Nuremberge,	91 1/8
Rouan,	89 1/4
Lions.	107 7/8
Parris,	93 1/8
Diepe	91 1/4
Geneue	82 1/4
Toulouse	111 3/4
Rochell	113 3/4
Marcellis	113 1/2
Uenice	152
Uienne, &c.	96
Aquila	143 1/2
Uienne	81 3/8
Preslaw.	122 5/8
Liebzig	92 1/4
Dantzicke,	117 1/4
Lubeck	88 5/8
Barcellone	130 3/4
Lishburne	90 1/8
Geanes,	143 1/4

The agreement of the suttell waight at Venice with the waightes at other places.

Venice suttell waight.

100 li suttle waight at Venice do make at	London.	67
	Andwerpe	64 $\frac{1}{2}$
	Francford &c.	59 $\frac{1}{4}$
	Collen & Ausberge	61 $\frac{1}{4}$
	Nuremberg	60
	Rouan	58 $\frac{1}{8}$
	Lions	71
	Parris	61 $\frac{1}{4}$
	Diepe	60
	Geneue	54 $\frac{1}{8}$
	Toulouse	73 $\frac{1}{2}$
	Rochell	74 $\frac{3}{4}$
	Marceillis	74 $\frac{3}{8}$
	Siuill &c.	65 $\frac{3}{4}$
	Venice Grosse	63 $\frac{1}{8}$
	Aquilla	94 $\frac{1}{8}$
	Vienne.	53 $\frac{1}{2}$
	Preslaw	80 $\frac{3}{4}$
	Liebzig	60 $\frac{5}{8}$
	Dantzig	77 $\frac{3}{8}$
	Lubec	58 $\frac{1}{4}$
	Barcellone	86
	Lishburne	59 $\frac{1}{4}$
	Scanes	94 $\frac{1}{8}$

The agreement of the grosse waight at *Venice with the waightes at other places.*

Venice grosse waight.

100 li grosse waight at Venice do make at

London.	196 $\frac{1}{4}$
Andwerpe	102 $\frac{1}{8}$
Francford. &c.	93 $\frac{7}{8}$
Collen & Ausberge	97
Nuremberg	95
Rouan	93
Lions	112 $\frac{3}{8}$
Parris	97
Diepe	95 $\frac{1}{8}$
Geneue	85 $\frac{3}{4}$
Toulouse	116 $\frac{1}{8}$
Rochell	118 $\frac{1}{2}$
Marceillis	117 $\frac{7}{8}$
Siuill. &c.	104 $\frac{1}{8}$
Venice Suttle	158 $\frac{1}{4}$
Aquilla	149 $\frac{1}{8}$
Vienne.	84 $\frac{3}{4}$
Preslaw	127 $\frac{3}{4}$
Liebzig	96
Danczig	132 $\frac{5}{8}$
Lubec	97 $\frac{3}{8}$
Barcellone	136 $\frac{1}{8}$
Lishburne the small waight.	92 $\frac{7}{8}$.
Geanes	149 $\frac{3}{8}$

¶ The agreemente of the waighte at *Parris*, *with the waightes at other places.*

Parris.

100 li. waight at Parris do make at

London	109 1/2
Andwerp	105 1/4
Frankforde &c.	96 1/4
Collen. &c.	102 1/4
Nuremberg.	97 7/8
Rouan.	095 3/4
Lions	155 7/8
Diepe	98
Geneue	88 1/4.
Toulouse	120.
Rochell	122 1/8
Marcellis	121 1/2
Siuill	107 1/4
Venice &c	164
Venice &c.	103
Aquila	153 1/4
Vienne	87 1/4
Preslaw	131 1/2.
Liebzig	94 1/8.
Dantzick.	126 1/4
Lubecke	95 1/2
Barcellone	140 1/8
Lishburne	96 1/4
Geanes	153 1/4

¶The agreemente of the waightes at *Vienne, with the waightes at other places.*

Vienne.

100 li. waight at Vienne to make at

London	125 $\frac{3}{4}$
Andwerp	120 $\frac{1}{4}$
Frankforde &c.	110 $\frac{3}{4}$
Collen &c.	114 $\frac{5}{8}$
Nuremberg	112
Rouan.	109 $\frac{5}{8}$
Lions	132 $\frac{1}{2}$
Parris	114 $\frac{5}{8}$
Diepe	112 $\frac{1}{8}$
Geneue	101 $\frac{1}{8}$
Tolouse	137 $\frac{1}{4}$
Rochell	139 $\frac{5}{8}$
Marcellis	139
Siuill	122 $\frac{3}{4}$
Venice &c.	186 $\frac{5}{8}$
Venice &c.	117 $\frac{7}{8}$
Aquila	175 $\frac{7}{8}$
Pyssaw	150 $\frac{5}{8}$
Liepzig	113 $\frac{1}{4}$
Dantzick.	144 $\frac{1}{2}$
Lubecke	108 $\frac{7}{8}$
Barcellone	160 $\frac{1}{2}$
Lishburne	110 $\frac{1}{4}$
Geanes	175 $\frac{7}{8}$

The agreement of the waight at *Preslaw*, with the waightes at other places.

Preslaw.

100 li. waight at Preslaw doe make at.

London.	83 [illegible]
Andwerpe,	79 [illegible]
Franckford,	73 [illegible]
Collen &c.	75 [illegible]
Nuremberge,	74 [illegible]
Rouan,	72 [illegible]
Lions,	88
Parris,	75 [illegible]
Diepe	74 [illegible]
Geneue	67 [illegible]
Toulouse.	91 [illegible]
Rochell	92 [illegible]
Marcellis	92 [illegible]
Siuill,	81 [illegible]
Venice, &c.	123 [illegible]
Venice. &c.	78 [illegible]
Aquila	116 [illegible]
Vienne	66 [illegible]
Liebzig,	75 [illegible]
Dantzicke,	96 [illegible]
Lubecke	72 [illegible]
Barcellone	106 [illegible]
Lisbburne	73 [illegible]
Geanes.	116 [illegible]

The agreement of thewaihte at *Liebsige, with the waighte at other places.*

Liebsige.

100 li. waight at Liebsige, doe make at	London	110 $\frac{2}{2}$
	Andwerpe	106 $\frac{1}{4}$
	Franckford,	97 $\frac{1}{4}$
	Collen &c.	100 $\frac{7}{8}$
	Nuremberge	98 $\frac{7}{8}$
	Rouan	96 $\frac{3}{4}$
	Lions.	117
	Parris	100 $\frac{7}{8}$
	Diepe	99
	Geneue	89 $\frac{1}{4}$
	Toulouse	121 $\frac{3}{5}$
	Rochell	123 $\frac{1}{4}$
	Marcelli s	122 $\frac{5}{8}$
	Siuill	108 $\frac{3}{8}$
	Venice suttell &c.	164 $\frac{1}{4}$
	Venice grosse. &c.	104
	Aquila	155 $\frac{1}{4}$
	Vienne.	88 $\frac{1}{4}$
	Preslaw	732 $\frac{7}{8}$
	Dantzicke	128 $\frac{1}{8}$
	Lubecke	96 $\frac{1}{8}$
	Barcellone	141 $\frac{5}{8}$
	Lishburne	97 $\frac{3}{4}$
	Geanes.	155 $\frac{1}{4}$

The agreement of the waight at *Dantzicke, with the waighte at other places.*

Dantzicke.

100 li. waight at Dantzke doe make at

London	86 $\frac{1}{8}$
Andwerpe	83 $\frac{1}{4}$
Franckforde,	76 $\frac{1}{2}$
Collen &c.	79
Nuremberge	77 $\frac{3}{8}$
Rouan	75 $\frac{3}{4}$
Lions.	91 $\frac{5}{8}$
Parris	79
Diepe	77 $\frac{1}{2}$
Geneue	69 $\frac{7}{8}$
Toulouse	94 $\frac{7}{8}$
Rochell	96 $\frac{1}{2}$
Marcellis	96 $\frac{3}{8}$
Siuill	84 $\frac{7}{8}$
Venice suttell &c.	129
Venice grosse. &c.	81 $\frac{1}{2}$
Aquila	121 $\frac{5}{8}$
Vienne.	69 $\frac{1}{2}$
Breslaw	104 $\frac{1}{8}$
Liebzig	78 $\frac{1}{4}$
Lubecke	75 $\frac{3}{8}$
Barcellone	111
Lishburne	76 $\frac{1}{2}$
Geanes. &c.	126 $\frac{5}{8}$

¶The agreemente of the waighte at *Lubeck, with the waights at other places.*

Lubeck.

100 li. waight at Lubeck do make at

London	115
Andwerp	110 1/2
Frankforde &c.	101 5/8
Collen. &c.	105
Nuremberg	102 3/4
Rouan.	100 5/8
Lions	121 5/8
Parris	150
Diepe	102 7/8
Geneue	92 3/4.
Toulouse	126
Rochell	128 1/4
Marcellis	127 1/2
Siuill	114 5/8
Venice &c.	171 1/4
Venice &c.	108 1/8
Aquila	161 1/2
Vienne	91 3/4
Preslaw	138 1/8
Liebzig	103 7/8.
Dantzick.	132 5/8
Barcellone	147 1/4
Lisbburne	101 3/8
Geanes	161 1/2

¶The agreemente of the waighte at *Barcellon with the waight at other places.*

100 li. waight at Barcellon doe make at		Barcellone.
	London	68
	Andwerpe	75
	Frankeford &c.	68 $\frac{5}{8}$
	Collen	71 $\frac{1}{4}$
	Nuremberg	69 $\frac{3}{4}$
	Rouan	68 $\frac{1}{4}$
	Lions	82 $\frac{1}{2}$
	Parris	71 $\frac{1}{4}$
	Diepe	69 $\frac{3}{4}$
	Geneue	62 $\frac{7}{8}$
	Toulouse	85 $\frac{1}{2}$
	Rochell	87
	Marcellis	86 $\frac{1}{2}$
	Siuill	76 $\frac{3}{8}$
	Venice &c.	116 $\frac{1}{4}$
	Venice. &c.	73 $\frac{1}{8}$
	Aquila	109 $\frac{1}{2}$
	Vienne	62 $\frac{7}{8}$
	Preslaw	93 $\frac{3}{4}$
	Liebzig	70 $\frac{1}{2}$
	Dantzick	90.
	Lubec	67 $\frac{3}{4}$
	Lishburne	68 $\frac{5}{8}$
	Geanes	109 $\frac{1}{2}$

The agreement of the Waightes at *Lishburne, with the waight at other places.*

Lishburne.

100 li, waight at lishburne do make at

London	113 1/8
Andwerpe	108 3/4
Franckford	100
Collen, &c.	103 1/4
Nuremberge	102 1/8
Rouan	99
Lions	119 5/8
Parris	103 1/4
Diepe	101 1/4
Geneue	91 1/4
Toulouse	124
Rochell	126 1/8
Marseilles.	125 1/2
Siuill	110 3/4
Venice, &c.	168 1/2
Venice, &c.	106 3/8
Aquila	158 3/4
Vienne	90 1/4
Preslaw	135 7/8
Liebzige	102 1/4
Dantzige	130 1/2
Lubecke	98 1/4
Barcellone	144 7/8
Geanes	158 3/4

The agreement of the waighte at *Geanes*, *with the waightes at other places.*

Geanes.

100 li, waight at Geanes doe make ac.	London.	$71\frac{1}{4}$
	Andwerpe,	$68\frac{1}{8}$
	Franckford,	$62\frac{7}{8}$
	Collen &c.	65
	Nuremberge,	$63\frac{1}{8}$
	Rouan,	$62\frac{1}{4}$
	Lions,	$75\frac{1}{4}$
	Parris,	65
	Diepe	$63\frac{1}{8}$
	Geneue	$57\frac{5}{8}$
	Toulouse.	78
	Rochell	$79\frac{3}{8}$
	Marcellis	79
	Siuill,	$69\frac{1}{4}$
	Venice, &c.	106
	Venice. &c.	67
	Aquila	100
	Vienne	$56\frac{3}{4}$
	Liebzig,	$85\frac{1}{4}$
	Danczicke,	$64\frac{1}{4}$
	Lubecke	$82\frac{1}{8}$
	Barcellone	$61\frac{7}{8}$
	Lishburne	$91\frac{1}{4}$
	Geanes.	$62\frac{7}{8}$

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